

638816

SAFETY COMPLIANCE TESTING FOR FMVSS 121

Air Brake Systems

**Vehicle: MY 2006 Morgan GVFD10324102
4x2, 24-ft. Van Body Truck
Morgan Corporation
Report #: 121V-TRC-06-006
NHTSA #: C60703
TRC Inc. Test #: 20040769/7004**

**Transportation Research Center Inc.
P. O. Box B-67
East Liberty, Ohio 43319-0367**



March 2007

Final Report

**U.S. Department of Transportation
National Highway Traffic Safety Administration
Enforcement**

Office of Vehicle Safety Compliance

400 Seventh Street, SW

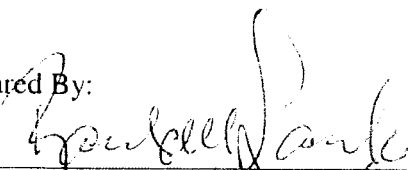
Room 6111 (NVS-220)

Washington, D.C. 20590

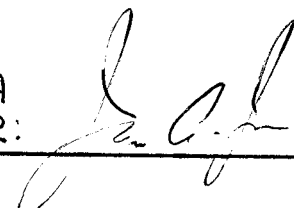
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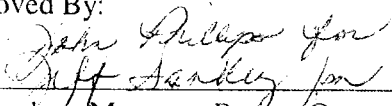
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 5/7/07

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				6. PERFORMING ORGANIZATION CODE: TRC 20040769/7004	
7. AUTHOR(S): Project Manager: RANDALL A. LANDES				8. PERFORMING ORGANIZATION REPORT NO.: 121V-TRC-06-006	
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12. SPONSORING AGENCY NAME AND ADDRESS: U.S. Department of Transportation National Highway Traffic Safety Administration Enforcement Office of Vehicle Safety Compliance (NVS-220) 400 Seventh Street, SW, Room 6111 Washington, DC 20590				13. TYPE OF REPORT AND PERIOD COVERED: Final test report Tested: 02/07/07 to 03/12/07	
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15. SUPPLEMENTARY NOTES:					
16. ABSTRACT: Compliance tests were conducted on the subject 2006 Morgan GVFD10324102, 4x2, 24-ft. Van Body Truck, NHTSA No. C60703, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-121V-05, for the determination of FMVSS 121 compliance. Test failures identified were as follows: None.					
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Section 1.0

Purpose of Compliance Test

Purpose

Transportation Research Center Inc. (TRC Inc.) conducted this program for the National Highway Traffic Safety Administration (NHTSA). The purpose of this test was to determine if the subject vehicle, a 2006 Morgan GVFD10324102 4x2, 24-ft.van body truck, meets the performance requirements of FMVSS 121, "Air Brake Systems."

Test Procedure

This test was conducted in accordance with NHTSA's Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No. TP-121V-05. Data was obtained relative to FMVSS 121, "Air Brake Systems." Deviations from the procedure: The only tests performed under section 10.2 "Laboratory Tests" were 10.2 I. "Brake Actuation and Release Timing." The test sequence was performed as follows:

1. Burnish GVWR
2. Brake Actuation and Release Timing GVWR
3. Service Brake Stops GVWR
4. Emergency Brake (Primary Reservoir Failure) Stops GVWR
5. Emergency Brake (Secondary Reservoir Failure) Stops GVWR
6. Emergency Brake (Primary Control Line Failure) Stops GVWR
7. Park Brake – Grade Holding GVWR
8. Stability & Control LLVW
9. Service Brake Stops LLVW
10. Emergency Brake (Primary Reservoir Failure) Stops LLVW
11. Emergency Brake (Secondary Reservoir Failure) Stops LLVW
12. Emergency Brake (Primary Control Line Failure) Stops LLVW
13. Park Brake – Grade Holding LLVW
14. Final Inspection

The vehicle information is summarized in Section 2.0. The test data summary is located in Section 3.0, the test data is located in Section 4.0, and the test summary is located in Section 5.0. Appendix A contains the still photographic prints. The Appendix lists the test data in Report Generator format.

Section 2.0

Vehicle Information

Vehicle Information

The completed test vehicle is a 2006 Morgan Corporation GVFD10324102, 4x2, 24-ft. Van Body Straight Truck, and the incomplete vehicle (cab/chassis) was a model 4300 SBA, manufactured by International Truck and Engine Corporation with a wheelbase of 255 inches. The Gross Vehicle Weight Rating (GVWR) is 33,000 pounds and the test vehicle is equipped with a Bendix, 4S/4M anti-lock brake system.

Section 3.0

Test Data Summary

Test Data Summary

Table 1

Summary of Data for Laboratory Test "Application & Release Times"

Average Times in Seconds	Application Max. Allowable – 0.45				Release Max. Allowable – 0.55			
	Right Steer #1	Right Drive #2	NA	NA	Right Steer #1	Right Drive #2	NA	NA
Full System Operating	0.234	0.294	NA	NA	0.413	0.388	NA	NA
ABS Main Power Failed	0.230	0.290	NA	NA	0.405	0.397	NA	NA
ABS Wheel Sensor Failed (Open)	0.236	0.296	NA	NA	0.400	0.397	NA	NA
ABS Wheel Sensor Failed (Short)	0.235	0.296	NA	NA	0.408	0.387	NA	NA

The nominal park brake chamber pressures were 0 psi, 3 seconds after control valve actuated.

Table 2

Data Summary of the Stopping Distances

Distance in Feet (Corrected Dist.)	GVWR		LLVW		Maximum Allowable
	Minimum	Maximum	Minimum	Maximum	(ft.)
1.2 Service Brakes	256.8	291.9	181.0	185.8	GVWR – 310 LLVW – 335
Failed Primary Reservoir	320.7	383.3	180.6	196.6	GVWR – 613 LLVW – 613
Failed Secondary Reservoir	387.7	436.4	296.2	309.5	GVWR – 613 LLVW – 613
Failed Primary Control Line	330.5	354.2	183.1	189.4	GVWR – 613 LLVW – 613

The vehicle passed the Stability and Control tests. For the vehicle type, only the LLVW mass condition is required.

Section 4.0

Test Data

TEST DATA
TABLE 3
VEHICLE INFORMATION SHEET - FMVSS 121

Vehicle: 2006 Morgan GVFD10324102, 4x2, 24-Ft. Van Body Truck

Veh. Number: C60703

Test No.: 20040769/7004

Test Date(s): 02/05/2007 to 03/07/07

Test Facility/Location: TRC/Transportation Research Center Inc., East Liberty, Ohio

Truck/Tractor Year, Make, and Model: 2006 Morgan GVFD10324102, 4x2, 24-ft. Van

Body Truck

Build Date: 02/05

VIN: 1HTMMAAN76H189586

Body No.: MWI05VB32497004

Chassis No.: No Data

GVWR: 33,000 lbs. GAWRs: 12,000 lbs. – Steer; 21,000 lbs. – Drive

Engine Data: Type: (Diesel, gas, other) Diesel

6 Cylinders

NA Cu. In.

7.6 Liter

225 HP

Transmission: 6 Speed

X Manual

 Automatic

 O.D.

Axle Drive Configuration: 4X2

Center of Gravity (in): No Data

Initial Odometer: 102,289 mi.

Wheelbase: Truck, (in): 255

Control Trailer, (in): N/A

Retarder(s) Type(s): None

Aerodynamic Treatments: Yes No X

BRAKES:

	Type ¹	Size	Make	Lining (Edge Code)
Axles:				
Steer #1	<u>Cam</u>	<u>15 x 4 in.</u>	<u>Meritor</u>	<u>MA212 FF</u>
Drive #2	<u>Cam</u>	<u>16.5 x 7 in.</u>	<u>Meritor</u>	<u>MA212 FF</u>
Drive #3	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Drive #4	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>

¹ Cam, disc, wedge, etc.

....Continued

BRAKE DRUM/ROTOR:

	Type ²	Make	Dust Shields Installed?
Axles:			
Steer #1	<u>Cast Drum</u>	<u>Gunite</u>	<u>Yes</u>
Drive #2	<u>Cast Drum</u>	<u>Gunite</u>	<u>Yes</u>
Drive #3	<u>NA</u>	<u>NA</u>	<u>NA</u>
Drive #4	<u>NA</u>	<u>NA</u>	<u>NA</u>

² Cast or composite drum, vented or non-vented rotor, etc.

ACTUATION DETAILS:

	AIR CHAMBERS		SLACK ADJUSTERS		
	Make	Type ³	Length or Wedge angle	Mfr.	Cam Rotation ⁴
Axles:					
Steer #1	<u>MGM</u>	<u>20L</u>	<u>5.5 in.</u>	<u>ArvinMeritor</u>	<u>Same</u>
Tag #2	<u>MGM</u>	<u>30LP3</u>	<u>5.5 in.</u>	<u>Rockwell</u>	<u>Same</u>
Drive #3	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Drive #4	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>

³ Size and diaphragm or piston

⁴ Same or opposite to forward wheel rotation

TIRES

	Pressure (psi)**	Size	Make	Model	Static Loaded Radius Measured*	Databook (Website)
Axles:						
Steer #1	<u>105 psi</u>	<u>11R22.5</u>	<u>Goodyear</u>	<u>G149 RSA</u>	<u>20.19 in.</u>	<u>19.4 in.</u>
Drive #2	<u>105 psi</u>	<u>11R22.5</u>	<u>Goodyear</u>	<u>G167 A</u>	<u>20.20 in.</u>	<u>19.7 in.</u>

*Measured at test GVWR.

REMARKS: There were dual tires at each wheel end on the rear drive axle, only.

**Tire pressures were per the vehicle rental company – a decal above each tire position.

....Continued

ABS:

Mfr: Bendix Model: (Part #) 5010168-R00 Configuration: 4S/4M

FRONT SUSPENSION:

Type: Solid Axle/Taper Leaf Spring Make: International* Model: I-120SG*

INTERMEDIATE (TAG) SUSPENSION:

Type: NA Make: NA Model: NA

REAR SUSPENSION:

Type: Solid Live Axle/Leaf Spring Make: Dana Spicer* Model: 2106OS*

Rear Axle Spread, (in): NA Overall Width (SAE J693): 96.5 in.

FIFTH WHEEL:

Fifth Wheel Height Relative to Ground (in): N/A Fifth Wheel Position, (in): N/A

AIR SYSTEM:

Compressor Capacity (cfm): 13.2*

Cut-out (psi): 118 (dash gauge)

Cut-in (psi): 62 (dash gauge)

Crack Pressure Ratings (psi)⁵:

1st Axle: No Data 2nd Axle: No Data Treadle Valve⁶: No Data

⁵ Relative to rear axle(s) centerline (include sketch if necessary)

⁶ Total crack pressures between treadle valve and brake chambers

Front Axle Limiting: No Data

Air Dryer: No Data

Air Compounding: No Data

Number of Brakes Controlled: Four brake positions ABS controlled, (4S/4M).

*Manufacturer's data.

....Continued

AIR TANK VOLUMES. (cu. in.):

Supply: No Data Primary: No Data Secondary: No Data
Auxiliary: No Data Isolated From Service? No Data

Note: Per manufacturer's data, nominal system capacity is 3484 cu. in.

SPECIAL CONDITIONS:

None.

WEIGHTS (lbs):

	Empty*	LLVW	Burnish	GVWR	GAWR
Axle:					
Steer #1	<u>7,440</u>	<u>7,860</u>	<u>12,000</u>	<u>12,000</u>	<u>12,000</u>
Drive #2	<u>10,140</u>	<u>10,210</u>	<u>20,990</u>	<u>20,990</u>	<u>21,000</u>
Drive #3	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Drive #4	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
Total:	<u>17,580</u>	<u>18,070</u>	<u>32,990</u>	<u>32,990</u>	<u>33,000</u>

REMARKS:

Placard GVWR: 33,000 lbs.

TEST DATA
TABLE 4
VERIFICATION OF REQUIRED EQUIPMENT

Vehicle: 2006 Morgan 24-ft. Van Body

Veh. No.: C60703

Date: 02-07-07 Driver: K. Easterday Technician: R. Landes Odometer: 102,292 mi.

SERVICE BRAKES

YES

NO

All Wheels Equipped with Brakes

X

All Brakes Equipped with Automatic Brake Adjusters

X

Brake Adjustment Indicators are visible from a location adjacent to or beneath the vehicle

X

ANTILOCK BRAKE SYSTEM

Antilock System Installed

X

Proper axle control

X

Comments: None

Antilock Warning Signal within Drivers Field-of-View
 Amber letters, black background, no audible warning

X

SERVICE RESERVOIRS

No. of Reservoirs 3

Automatic Condensate drain valve(s) or supply reservoir

X

Automatic Operation of condensate drain valve

X

Each Reservoir has a Drain Valve which can be manually operated

X

PARKING BRAKES

Parking Brake Control Separate from Service Brake Control

X

Parking Brake Control Accessible from Operator's Seat

X

Parking Brake control is identified in a manner that specifies its operation

X

Parking Brake Control Operates Parking Brakes of Towed Vehicle

 N/A

 Yes

X No

REMARKS: None.

LABORATORY TESTS
TABLE 5
BRAKE ACTUATION AND RELEASE TIMES

Vehicle: 2006 Morgan 24-ft. Van Body

Veh. Number: C60703

Date: 02-26-07

Driver: R. Landes

Technician: R. Landes

FULL SYSTEM - ABS MAIN POWER ACTIVE								
Run No.	Right Steer #1		Right Drive #2		NA		NA	
	Apply (sec)	Release (sec)	Apply (sec)	Release (sec)	Apply (sec)	Release (sec)	Apply (sec)	Release (sec)
1	0.233	0.410	0.291	0.382				
2	0.236	0.417	0.297	0.388				
3	0.234	0.411	0.293	0.394				
Avg.	0.234	0.413	0.294	0.388				
FULL SYSTEM - ABS MAIN POWER FAILED								
1	0.232	0.414	0.291	0.404				
2	0.230	0.400	0.290	0.397				
3	0.229	0.400	0.289	0.391				
Avg.	0.230	0.405	0.290	0.397				
ABS - WHEEL SENSOR FAILED - OPEN								
1	0.236	0.382	0.296	0.396				
2	0.237	0.403	0.297	0.402				
3	0.235	0.414	0.295	0.394				
Avg.	0.236	0.400	0.296	0.397				
ABS - WHEEL SENSOR FAILED - SHORT								
1	.0237	0.410	0.297	0.391				
2	0.233	0.408	0.293	0.383				
3	0.236	0.407	0.298	0.387				
Avg.	0.235	0.408	0.296	0.387				

REMARKS: To simulate the "Open" failure and immediately adjacent to the wheel, the right drive axle #2 wheel speed sensor lead was disconnected. To simulate the "Shorted" failure and immediately adjacent to the wheel, the right drive axle #2 wheel speed sensor connector was disconnected and the two receptacle wire ends to the ABS ECU were connected with a wire. For the ABS Active tests, the ignition was in the ON/RUN position with the engine not running. For the ABS Main Power Failed tests, the ignition was in the OFF position. All tests were performed with the vehicle attached to "shop" air and regulated to approximately 100 psi.

ROAD TESTS
TABLE 6
PARK BRAKE CHAMBER ACTUATION PRESSURE

PARKING BRAKE TEST

Vehicle: 2006 Morgan 24-ft. Van Body

Vehicle Number: C60703

Test Performed By: R. Landes

Date: 02-26-07

PARK BRAKE CHAMBER ACTUATION PRESSURE

AXLE # 2

RUN NUMBER	PRESSURE IN INTERMEDIATE PARKING CHAMBER AFTER 3 SECONDS (PSI)	
	LEFT	RIGHT
1	0.3	0.2
2	0.2	0.1
3	0.1	0.1
AVERAGE	0.2	0.13

If average pressure is less than or equal to 3 psi, use 0 psi

REMARKS: Average time to reach 3 psi – 0.58 sec. – both chambers.

Note: Tables 7 through 9 are for tests not performed by the laboratory and are, therefore, not included.

**ROAD TESTS
TABLE 10
BURNISH**

Vehicle: 2006 Morgan, 24-ft. Van Body

Vehicle Number: C60703

8.1 BURNISH TEST WEIGHT STEER AXLES: 12,000 lbs DRIVE/TAG AXLES: 20,990 lbs			
Driver No.	Date	Odometer Start	Odometer End
1	02/21/07	102,329	102,458
1	02/22/07	102,460	102,713
1	02/23/07	102,716	102,841

	Date	Time	Odometer
Test Start	02/21/07	11:15	102,329
Test Finish	02/23/07	11:30	102,841

ADJUSTMENT LEVELS								
	1L	1R	2L	2R	3L	3R	4L	4R
Initial	1/2 in.	1/2 in.	1/2 in.	1/2 in.	NA	NA	NA	NA
1st	1/2 in.	1/2 in.	1/2 in.	1/2 in.	NA	NA	NA	NA
2nd	1/2 in.	1/2 in.	1/2 in.	1/2 in.	NA	NA	NA	NA
3rd	1/2 in.	3/8 in.	1/2 in.	1/2 in.	NA	NA	NA	NA
Final	7/16 in.	3/8 in.	7/16 in.	7/16 in.	NA	NA	NA	NA

REMARKS: Very shortly after initialing burnish, the right front and rear axle brakes began to get hot. At Snub #33, the right front axle brake freestroke was approximately zero. A mechanic adjusted the right front and rear axle freestrokes to 5/8 in. measurement. "Freestroke" measurement values were checked and *if* required, adjusted to 1/2 in. at the required intervals and at brake temperatures below 200 degrees F. All initial Burnish adjustment clearances were set at 1/2 in. All post-Burnish adjustments set to 1/2 in. freestroke.
Driver #1 – Richard Heberling.

....Continued

Snub #	Initial Speed (mph)	Avg. Cntrl. Press. (psi)	Avg. Decel (ft/s ²)	Initial Brake Temperatures °F											
				1L	1R	2L	2R								
1	40.0	45.0	8.9	72	77	76	78								
25	40.1	75.6	10.6	253	348	471	512								
50	39.6	72.5	10.1	267	536	392	361								
75	40.7	60.7	10.4	263	322	438	436								
100	39.6	60.7	11.3	260	331	438	457								
125	39.8	56.8	10.4	255	334	432	460								
150	40.0	55.7	10.6	230	296	306	322								
175	40.6	50.1	9.6	229	316	319	348								
200	39.8	53.5	10.5	220	308	313	343								
225	40.2	51.9	10.4	226	309	317	354								
250	40.0	51.7	10.3	222	311	324	373								
275	40.2	49.3	10.2	230	313	322	359								
300	39.9	53.4	10.5	225	300	321	358								
325	40.2	53.2	10.3	226	301	318	358								
350	40.7	51.2	9.8	224	303	321	363								
375	39.4	48.8	10.0	219	300	325	371								
400	40.0	52.4	10.2	207	274	330	367								
425	40.1	49.1	9.6	201	288	348	391								
450	40.7	50.1	10.2	205	295	354	399								
475	40.2	52.3	10.4	206	299	352	401								
500	39.4	53.2	10.6	208	293	350	399								

(Table continued on next page)

REMARKS: #1 = steer axle; #2 = drive axle.

....Continued

Snub #	Initial Target Speed mph	Ambient Temp °F	Comments	Driver Initials	Time
1	40	28	Initiate.	RH	11:15
25	40	30		RH	
50	40	33	Adjust. @ Snub #33.	RH	12:15
75	40	32		RH	
100	40	31		RH	
125	40	30	End shift.	RH	16:28
150	40	36	Check adjust./begin shift.	RH	8:29
175	40	35		RH	
200	40	36		RH	
225	40	35		RH	
250	40	35	Check adjust.	RH	12:00
275	40	35	Resume shift.	RH	13:42
300	40	34		RH	
325	40	34		RH	
350	40	33		RH	
375	40	33	End shift.	RH	16:07
400	40	16	Check adjust./begin shift.	RH	8:04
425	40	18		RH	
450	40	20		RH	
475	40	21		RH	
500	40	21	Check adjustment/end test.	RH	11:30

REMARKS: None.

DATA SHEET 11

SERVICE BRAKE STOPPING TEST @ GVWR

Vehicle: 2006 Morgan, 24-ft. Van Body

TRC Vehicle No.: C60703 Initial/End Odo.: 102,873 / 102,895

Date: 02/28/07 Driver: R. Heberling Tech./Video: S. Wagoner

Project/Segment Nos.: 20040769/7004 Time: 9:50 – 11:08

Ambient Temperature: 32° to 100°F.

IBTs: 150° to 200°F.

Requirements: Air system fully charged before each stop.

With ABS - fully apply service brake; without - driver modulates control.

Perform stops in neutral or with clutch depressed.

One of the six stops MUST be equal or less than the requirement distance.

Manual brake adjustments permitted prior to performing stops.

Brake Stroke Measurements @ 85 psi (in) "Free" Stroke Measurements (in.)

Axle 1 Left/Right 1 1/2 / 1 1/2 Axle 1 Left/Right 1/2 / 1/2

Axle 2 Left/Right 1 5/8 / 1 5/8 Axle 2 Left/Right 5/8 / 5/8

Axle 3 Left/Right NA / NA Axle 3 Left/Right NA / NA

Axle 4 Left/Right NA / NA Axle 4 Left/Right NA / NA

Dist. Req. (ft.) @ 60: GVW&LLVW Bus: 280; GVW Truck: 310; LLVW Truck & Tractor: 335; GVWR Tractor: 355.

60 MPH SERVICE BRAKE STOPS - GVWR

Stop	Application Pressure (psi)	Initial Speed (mph)	Actual Stopping Distance (feet)	Corrected Stopping Distance per SAE J299	In 12 foot Lane?	Wheel Lock-up Indication Position, Spd. (mph), Time locked (sec.)	Comments
1	108.3	60.5	273.0	268.7	Yes	No	Video Tape
2	99.5	60.2	293.8	291.9	Yes	No	Video Tape
3	104.7	60.2	277.8	276.1	Yes	No	None
4	110.6	60.8	264.0	256.8	Yes	No	None
5	99.6	61.2	279.1	267.9	Yes	No	None
*6	109.4	19.8	28.4	28.9	Yes	No	Video Tape

Ambient Temp.: 33°F Wind Speed/Dir.: 8 mph, 223°SW

Comments: *Not required – indicant test, only.

DATA SHEET 12
EMERGENCY BRAKE STOPPING TEST
PRIMARY RESERVOIR FAILURE @ GVWR

Vehicle: 2006 Morgan, 24-ft. Van Body

TRC Vehicle No.: C60703 Initial/End Odo.: 102,895 / 102,917

Date: 02/28/07 Driver: R. Herberling Tech./Video: S. Wagoner

Project/Segment Nos.: 20040769/7004 Time: 11:09 – 12:29

Ambient Temperature: 32° to 100°F.

IBTs: 150° to 200°F.

Requirements: Air system fully charged before each stop.

With ABS - fully apply service brake; without - driver modulates control.

Perform stops in neutral or with clutch depressed.

One of the six stops MUST be equal or less than the requirement distance.

Engage service brake between three and five seconds *after* warning displayed.

Dist. Req. (ft.) @ 60 mph: All Vehicles EXCEPT Tractors: 613; Unloaded Tractors: 720.

60 MPH EMERGENCY BRAKE STOPS - GVWR (Primary Reservoir)

Stop	Application Pressure (psi)	Initial Speed (mph)	Actual Stopping Distance (feet)	Corrected Stopping Distance per SAE J299	In 12 foot Lane?	Wheel Lock-up Indication Position, Spd. (mph), Time locked (sec.)	Comments
1	9.3	59.7	378.8	383.3	Yes	No	Video Tape
2	25.3	58.7	320.9	335.0	Yes	No	Video Tape
3	20.1	59.7	329.5	332.6	Yes	No	None
4	21.6	60.7	333.5	326.5	Yes	No	None
5	19.5	60.0	331.6	331.4	Yes	No	None
6	21.1	60.3	324.0	320.7	Yes	No	None
7*	19.4	20.9	38.2	35.0	Yes	No	Video Tape

Ambient Temp.: 34°F Wind Speed/Dir.: 7 mph, 102°SE

Comments: *Not required – indicant test, only. See Appendix C.

DATA SHEET 13
EMERGENCY BRAKE STOPPING TEST
SECONDARY RESERVOIR FAILURE @ GVWR

Vehicle: 2006 Morgan, 24-ft. Van Body
 TRC Vehicle No.: C60703 Initial/End Odo.: 102,917 / 102,941
 Date: 02/23/07 Driver: R. Heberling Tech./Video: S. Wagoner
 Project/Segment Nos.: 20040769/7004 Time: 12:35 – 14:44

Ambient Temperature: 32° to 100°F.

IBTs: 150° to 200°F.

Requirements: Air system fully charged before each stop.

With ABS - fully apply service brake; without - driver modulates control.

Perform stops in neutral or with clutch depressed.

One of the six stops MUST be equal or less than the requirement distance.

Engage service brake between three and five seconds *after* warning displayed.

Dist. Req. (ft.) @ 60 mph: All Vehicles EXCEPT Tractors: 613; Unloaded Tractors: 720.

60 MPH EMERGENCY BRAKE STOPS - GVWR (Secondary Reservoir)

Stop	Application Pressure (psi)	Initial Speed (mph)	Actual Stopping Distance (feet)	Corrected Stopping Distance per SAE J299	In 12 foot Lane?	Wheel Lock-up Indication Position, Spd. (mph), Time locked (sec.)	Comments
1	110.3	59.4	388.6	396.5	Yes	No	Video Tape
2	109.8	60.9	399.1	387.7	Yes	No	Video Tape
3	109.4	60.4	441.7	436.4	Yes	No	Video Tape
4	111.0	60.3	408.3	403.7	Yes	No	None
5	108.4	60.1	416.6	415.7	Yes	No	None
6	109.0	60.3	413.5	409.3	Yes	No	None
7*	97.0	20.3	44.0	42.7	Yes	No	Video Tape

Ambient Temp.: 37°F Wind Speed/Dir.: 5 mph, 110°ESE

Comments: *Not required – indicant test, only. See Appendix C.

DATA SHEET 14
EMERGENCY BRAKE STOPPING TEST
PRIMARY CONTROL LINE FAILURE @ GVWR

Vehicle: 2006 Morgan, 24-ft. Van Body

TRC Vehicle No.: C60703 Initial/End Odo.: 102,943 / 102,993

Date: 03/05/07 Driver: R. Heberling Tech./Video: R. Landes

Project/Segment Nos.: 20040769/7004 Time: 14:00 - 15:05

Ambient Temperature: 32° to 100°F.

IBTs: 150° to 200°F.

Requirements: Air system fully charged before each stop.

With ABS - fully apply service brake; without - driver modulates control.

Perform stops in neutral or with clutch depressed.

One of the six stops MUST be equal or less than the requirement distance.

Engage service brake any time after opening solenoid.

Dist. Req. (ft.) @ 60 mph: All Vehicles EXCEPT Tractors: 613; Unloaded Tractors: 720.

60 MPH EMERGENCY BRAKE STOPS - GVWR (Primary Control Line)

Stop	Application Pressure (psi)	Initial Speed (mph)	Actual Stopping Distance (feet)	Corrected Stopping Distance per SAE J299	In 12 foot Lane?	Wheel Lock-up Indication Position, Spd. (mph), Time locked (sec.)	Comments
1	97.5	60.1	350.6	348.9	Yes	No	Video Tape
2	104.2	60.2	332.1	330.5	Yes	No	Video Tape
3	99.8	59.8	351.5	354.2	Yes	No	None
4	105.7	60.0	336.0	336.0	Yes	No	None
5	105.1	59.8	332.9	334.6	Yes	No	None
6*	105.3	20.7	37.6	35.3	Yes	No	Video Tape

Ambient Temp.: 35°F Wind Speed/Dir.: 24 mph, 292°W

Comments: *Not required – indicant test, only.

**ROAD TESTS
DATA SHEET 15
PARK BRAKE TEST
20% GRADE HOLDING - GVWR**

Vehicle: 2006 Morgan, 24-ft. Van Body

TRC Vehicle No.: C60703 Initial/End Odo.: 102,996

Date: 03/05/07 Driver: R. Heberling Tech./Video: R. Landes/S.Wagoner

Project/Segment Nos.: 20040769/7004 Time: 14:44 - 15:14

Ambient Temperature: 32° to 100°F.

IBT's: 150° to 200°F.

Parking Brake Chamber(s) Pressure 0 psi

20% GRADE HOLDING - GVWR

<u>X</u> GVWR <u> </u> LLVW	Initial Brake Temperature(s) (°F)	Control Pressure to Hold Vehicle (psi)	Movement to Become Stationary on Grade (inches)	Stationary on Grade For 5 minutes	
				Yes	No
	Hottest Brake				
Up Grade*	194	38	0	X	
Down Grade	170	38	0	X	

Ambient Temp.: 35°F

Wind Speed: 18 mph

Direction: 304°WNW

REMARKS: The test vehicle remained stationary on the grade facing upgrade and downgrade for the required 5-minute period. Therefore, Static Retardation Force Test not required.

Note: Static Retardation Force @ GVWR was not required; therefore, Data Sheet 16 is not included.

ROAD TESTS
DATA SHEET 17
STABILITY & CONTROL @ LLVW

Vehicle: 2006 Morgan, 24-ft. Van Body Veh. No.: C60703

Initial/End Odo.: 103,008 – 103,009

Date: 03-06-07 Driver: R. Herberling Observer/Video: R. Landes

Project/Segment Nos.: 20040769/7004 Time: 13:06 - 13:18

Manually Controlled Retarder: NA

Maximum Drive Through Speed 32 mph

75% of Max Drive Through Speed 24 mph

STABILITY & CONTROL - LLVW

Stop No.	*Initial Speed (mph)	Apply Time (sec)	Approx. Dist. Out of Lane (ft)	Number Markers Hit	Comments
1	24.0	0.254	0	0	Video Tape
2	24.1	0.120	0	0	Video Tape
3	24.9	0.111	0	0	Video Tape
4	24.0	0.177	0	0	Video Tape

Ambient Temp.: 21°F

Wind Speed: 4 mph

Direction: 147°SW

REMARKS: The vehicle remained in the lane during all four stops.

DATA SHEET 18
SERVICE BRAKE STOPPING TEST @ LLVW

Vehicle: 2006 Morgan, 24-ft. Van Body

TRC Vehicle No.: C60703 Initial/End Odo.: 103,050 / 103,067

Date: 03/08/07 Driver: R. Heberling Tech./Video: R. Landes

Project/Segment Nos.: 20040769/7004 Time: 13:06 – 13:39

Ambient Temperature: 32° to 100°F.

IBTs: 150° to 200°F.

Requirements: Air system fully charged before each stop.

With ABS - fully apply service brake; without - driver modulates control.

Perform stops in neutral or with clutch depressed.

One of the six stops MUST be equal or less than the requirement distance.

Manual brake adjustments permitted prior to performing stops.

Brake Stroke Measurements @ 85 psi (in)

"Free" Stroke Measurements (in.)

Axle 1 Left/Right NA / NA

Axle 1 Left/Right 7/16 / 1/2

Axle 2 Left/Right NA / NA

Axle 2 Left/Right 1/2 / 1/2

Axle 3 Left/Right NA / NA

Axle 3 Left/Right NA / NA

Axle 4 Left/Right NA / NA

Axle 4 Left/Right NA / NA

Dist. Req. (ft.) @ 60: GVW&LLVW Bus: 280; GVW Truck: 310; LLVW Truck & Tractor: 335; GVWR Tractor: 355.

60 MPH SERVICE BRAKE STOPS - LLVW

Stop	Application Pressure (psi)	Initial Speed (mph)	Actual Stopping Distance (feet)	Corrected Stopping Distance per SAE J299	In 12 foot Lane?	Wheel Lock-up Indication Position, Spd. (mph), Time locked (sec.)	Comments
1	105.2	59.7	184.1	185.8	Yes	#2L – 7; #2R - 4, both to end, 0.5s	Video Tape
2	107.3	59.9	184.0	184.7	Yes	#2L – 7 moment.; #2R – 3 to end	Video Tape
3	107.3	61.0	187.2	181.1	Yes	#2L & R – 10 momentary	None
4	105.3	60.8	194.8	189.6	Yes	#2L & R – 7 momentary	None
5	106.3	59.4	177.2	181.0	Yes	#2L – 6; #2R - 4, both to end, 0.4s	None
6*	108.0	20.9	26.1	24.0	Yes	#2L – 18 moment.; #2L & R - 7 to end, 0.5s	Video Tape

Ambient Temp.: 34°F Wind Speed/Dir.: 1 mph, 198°S

Comments: *Not required – indicant test, only.

DATA SHEET 19
EMERGENCY BRAKE STOPPING TEST
PRIMARY RESERVOIR FAILURE @ LLVW

Vehicle: 2006 Morgan, 24-ft. Van Body

TRC Vehicle No.: C60703 Initial/End Odo.: 103,067 / 103,084

Date: 03/08/06 Driver: R. Heberling Tech./Video: R. Landes

Project/Segment Nos.: 20040769/7004 Time: 13:39 – 14:19

Ambient Temperature: 32° to 100°F.

IBTs: 150° to 200°F.

Requirements: Air system fully charged before each stop.

With ABS - fully apply service brake; without - driver modulates control.

Perform stops in neutral or with clutch depressed.

One of the six stops MUST be equal or less than the requirement distance.

Engage service brake between three and five seconds *after* warning displayed.

Dist. Req. (ft.) @ 60 mph: All Vehicles EXCEPT Tractors: 613; Unloaded Tractors: 720.

60 MPH EMERGENCY BRAKE STOPS - LLVW (Primary Reservoir)

Stop	Application Pressure (psi)	Initial Speed (mph)	Actual Stopping Distance (feet)	Corrected Stopping Distance per SAE J299	In 12 foot Lane?	Wheel Lock-up Indication Position, Spd. (mph), Time locked (sec.)	Comments
1	23.3	57.7	181.6	196.6	Yes	#2R – 41, to end, 2.5	Video Tape
2	20.9	56.4	168.4	190.9	Yes	#2R – 43, 3.0; #2L – 22, 2.5, both to end	Video Tape
3	22.4	58.9	186.4	193.3	Yes	#2R – 46, 3.0, to end	None
4	20.1	59.6	181.6	184.1	Yes	#2R – 16, 1.0; #2L – 3, 0.1, both to end	None
5	21.5	59.9	180.2	180.6	Yes	#2R – 20, 1.2; #2L – 4, 0.2, both to end	None
6	20.4	20.3	25.1	24.3	Yes	#2R – 15, 0.9, to end	Video Tape

Ambient Temp.: 35°F Wind Speed/Dir.: 7 mph, 95°E

Comments: *Not required – indicant test, only.

DATA SHEET 20
EMERGENCY BRAKE STOPPING TEST
SECONDARY RESERVOIR FAILURE @ LLVW

Vehicle: 2006 Morgan, 24-ft. Van Body

TRC Vehicle No.: C60703 Initial/End Odo.: 16,837 / 16,851

Date: 01/23/07 Driver: R. Heberling Tech./Video: R. Landes

Project/Segment Nos.: 20040769/7004 Time: 11:35

Ambient Temperature: 32° to 100°F.

IBTs: 150° to 200°F.

Requirements: Air system fully charged before each stop.

With ABS - fully apply service brake; without - driver modulates control.

Perform stops in neutral or with clutch depressed.

One of the six stops **MUST** be equal or less than the requirement distance.

Engage service brake between three and five seconds *after* warning displayed.

Dist. Req. (ft.) @ 60 mph: All Vehicles EXCEPT Tractors: 613; Unloaded Tractors: 720.

60 MPH EMERGENCY BRAKE STOPS - LLVW (Secondary Reservoir)

Stop	Application Pressure (psi)	Initial Speed (mph)	Actual Stopping Distance (feet)	Corrected Stopping Distance per SAE J299	In 12 foot Lane?	Wheel Lock-up Indication Position, Spd. (mph), Time locked (sec.)	Comments
1	105.7	59.9	303.2	304.8	Yes	#2R – 5, 0.8, to end	Video Tape
2	108.1	59.7	305.9	309.5	Yes	#2R – 5, 0.7, to end	Video Tape
3	106.9	59.8	303.1	305.5	Yes	#2R & L – 3, 0.4 both to end	None
4	109.0	60.1	306.1	305.4	Yes	#2R – 5, 0.7, to end	None
5	108.4	60.3	298.9	296.2	Yes	#2R – 4, 0.4, to end	None
6*	107.2	21.1	44.3	39.9	Yes	#2L & R – 6, 0.8, both to end	Video Tape

Ambient Temp.: 36°F Wind Speed/Dir.: 6 mph, 52°NE

Comments: *Not required – indicant test, only.

DATA SHEET 21
EMERGENCY BRAKE STOPPING TEST
PRIMARY CONTROL LINE FAILURE @ LLVW

Vehicle: 2006 Morgan, 24-ft. Van Body

TRC Vehicle No.: C60703 Initial/End Odo.: 103,106 / 103,127

Date: 03/08/07 Driver: R. Heberling Tech./Video: R. Landes

Project/Segment Nos.: 20040769/7004 Time: 15:39 – 16:22

Ambient Temperature: 32° to 100°F.

IBTs: 150° to 200°F.

Requirements: Air system fully charged before each stop.

With ABS - fully apply service brake; without - driver modulates control.

Perform stops in neutral or with clutch depressed.

One of the six stops MUST be equal or less than the requirement distance.

Engage service brake any time after opening solenoid.

Dist. Req. (ft.) @ 60 mph: All Vehicles EXCEPT Tractors: 613; Unloaded Tractors: 720.

60 MPH EMERGENCY BRAKE STOPS - LLVW (Primary Control Line)

Stop	Application Pressure (psi)	Initial Speed (mph)	Actual Stopping Distance (feet)	Corrected Stopping Distance per SAE J299	In 12 foot Lane?	Wheel Lock-up Indication Position, Spd. (mph), Time locked (sec.)	Comments
1	103.8	59.2	181.5	186.4	Yes	#2R – 30, 1.9; #2L – 5, 0.4, both to end	Video Tape
2	104.7	60.1	188.4	187.8	Yes	#2R – 31, 2.1, to end	Video Tape
3	104.3	60.4	192.1	189.4	Yes	#2R – 37, 2.5, to end	Video Tape
4	107.0	60.2	184.5	183.4	Yes	#2R – 4, 0.5, to end	Video Tape
5	105.5	59.3	179.0	183.1	Yes	#2R – 9, 0.8, to end	None
6*	103.5	20.1	27.6	27.5	Yes	#2R – 15, 1.0; #2L – 11, 0.7, both to end	Video Tape

Ambient Temp.: 37°F Wind Speed/Dir.: 6 mph, 82°F

Comments: *Not required – indicant test, only.

**ROAD TESTS
DATA SHEET 22
PARK BRAKE TEST
20% GRADE HOLDING - LLVW**

Vehicle: 2006 Morgan, 24-ft. Van Body

TRC Vehicle No.: C60703 Initial/End Odo.: 103,129 / 103,129

Date: 03/08/07 Driver: R. Heberling Tech./Video: R. Landes/S. Wagoner

Project/Segment Nos.: 20040769/7004 Time: 16:32 – 16:48

Ambient Temperature: 32° to 100°F.

IBT's: 150° to 200°F.

Parking Brake Chamber(s) Pressure 0 psi

20% GRADE HOLDING - LLVW

<u> </u> GVWR <u>X</u> LLVW	Initial Brake Temperature(s) (°F)	Control Pressure to Hold Vehicle (psi)	Movement to Become Stationary on Grade (inches)	Stationary on Grade For 5 minutes	
				Yes	No
	Hottest Brake				
Up Grade*	200	23	0	X	
Down Grade	185	24	0	X	

Ambient Temp.: 37°F

Wind Speed: 7 mph

Direction: 96°E

REMARKS: The test vehicle remained stationary on the grade facing both upgrade and downgrade for the required five-minute period.

DATA SHEET 23
FINAL INSPECTION

Vehicle: 2006 Morgan, 24-ft. Van Body

TRC Vehicle No.: C60703 Final Odo.: 103,151

Project/Segment Nos.: 20040769/7004 Time: 16:30

Date: 03/12/07 Driver: NA Tech.: R. Landes

Brake Stroke Measurements @ 85 PSI (in.) "Free-Stroke" Measurements (in.)

Axle 1 Left/Right 1 1/8 / 1 1/8

Axle 1 Left/Right 3/8 / 3/8

Axle 2 Left/Right 1 1/2 / 1 1/2

Axle 2 Left/Right 1/2 / 1/2

Axle 3 Left/Right N/A / N/A

Axle 3 Left/Right 1/2 / 1/2

Axle 4 Left/Right N/A / N/A

Axle 4 Left/Right 1/2 / 3/8

SERVICE BRAKES

All Brakes Structurally Intact: ☒ Yes No

All Brakes Function Properly: ☒ Yes No

All Brakes Adjusted Within Manufacturers Recommendation: ☒ Yes No

Overall Condition of Test Vehicle: Good - Used.

Tires replaced: ☐ Yes ☒ No

New Brake Linings: Axle #1 ☒ Yes ☐ No; Axle #2 ☒ Yes ☐ No;
Axle #3 ☐ Yes ☐ No; Axle #4 ☐ Yes ☐ No

Additional Comments:

Overall condition of the foundation brakes, post-test, would be described as normal in appearance and color. Some minor surface fractures were present, but no deep fractures or separations appeared on the linings. Also, the drum's appearance would be described as normal, with moderate "bluing" of left steer and left drive axle drums.

Section 5.0

Instrumentation List

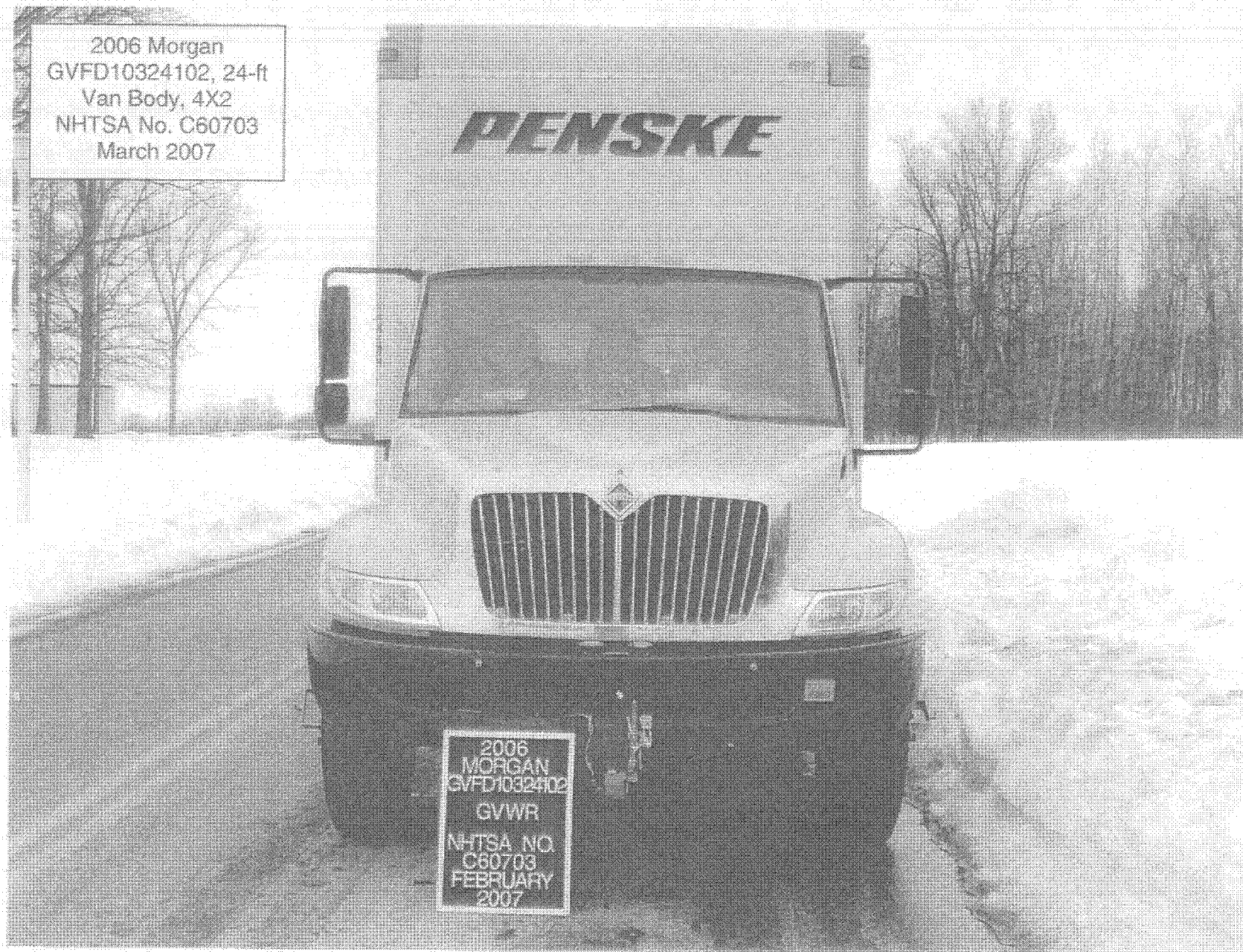
Instrumentation List

Instrumentation	Serial Number (I.D. No.)	Calibration Date	Next Calibration Date
A-DAT DSR-6 Radar Fifth Wheel	140.00182	Daily on a measured mile	N/A
Lock-Up Detection System	TRC Prop.	Calibrated before test	N/A
Treadle Pressure Transducer	PT-897090	Calibrated before test using a dead weight	N/A
Pressure Transducer	PT-359018	Calibrated before test using a dead weight	N/A
Pressure Transducer	PT-351132	Calibrated before test using a dead weight	N/A
Pressure Transducer	PT-169755	Calibrated before test using a dead weight	N/A
Pressure Transducer	PT-355434	Calibrated before test using a dead weight	N/A
Mansfield-Green Dead Weight Calibrator	DW-6253	03/23/06	03/23/07
Setra Accelerometer	A-167627	Calibrated before test utilizing known calibrated inclines.	N/A
Davis Weather Sys. 6152	A50609A02	06/11/06	06/11/07
Thermocouples	T52-0B-24K	Calibrated before test	N/A
Toledo Mettler Scales	JXGA- 5318823-5KD	02/26/07	05/26/07
Safety Gauge, Tire Pressure Gauge (0-160 psi)	AG-003	01/04/07	04/04/07
LINK System	2037	03/28/05	03/28/07
Toshiba PC (used with LINK)	43248	N/A	N/A

APPENDIX A

PHOTOGRAPHS

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



2006
MORGAN
GVFD10324102
GVWR
NHTSA NO.
C60703
FEBRUARY
2007

Front View @ GVWR

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



Right Side View @ GVWR

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



Left Side View @ GVWR

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007

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2006
MORGAN
GVFD10324102
GVWR
NHTSA NO
C60703
FEBRUARY
2007

Rear View @ GVWR

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



Front View @ LLWW

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



Right Side View @ LLVW

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



Left Side View @ LLVW

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



Rear View @ LLVW

2006 Morgan
 GVFD10324102, 24-ft
 Van Body, 4X2
 NHTSA No. C60703
 March 2007

MANUFACTURED BY: **MORGAN**
 35 THOUSAND OAKS BLVD.
 P.O. BOX 588
 MORGANTOWN, PA. 15060

DATE OF MANUFACTURE: MO. ____ YR. ____
 INCOMPLETE VEHICLE MANUFACTURED BY: ____

DATE INC. VEH. MFD: MO. ____ YR. ____
 GAWR: ____ KG (____ LB)

GAWR-FRONT: ____ KG (____ LB)
 WIDTH: ____ RIMS @ ____ PSI COLD ____

GAWR-INTERMEDIATE: ____ KG (____ LB)
 WIDTH: ____ RIMS @ ____ PSI COLD ____

GAWR-REAR: ____ KG (____ LB)
 WIDTH: ____ RIMS @ ____ PSI COLD ____

CONFORMITY OF THE CHASSIS-CAB TO
 U.S.A. FEDERAL MOTOR VEHICLE SAFETY
 STANDARDS, WHICH HAVE BEEN
 PREVIOUSLY FULLY CERTIFIED BY THE
 INCOMPLETE VEHICLE MANUFACTURER
 BY THE INTERMEDIATE VEHICLE
 MANUFACTURER, HAS NOT BEEN
 AFFECTED BY FINAL-STAGE
 MANUFACTURE. THE VEHICLE HAS BEEN
 COMPLETED IN ACCORDANCE WITH THE
 MANUFACTURER'S INSTRUCTIONS,
 APPLICABLE. THIS VEHICLE CONFORMS
 TO ALL OTHER APPLICABLE U.S.A. FEDERAL
 MOTOR VEHICLE SAFETY STANDARDS.
 EFFECT IN: MO. ____ YR. ____

VEHICLE IDENTIFICATION NO.:
 VEHICLE TYPE: PN 081706

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007

INTERNATIONAL TRUCK AND ENGINE CORPORATION
WARRENVILLE, ILLINOIS

VIN

1HTMMAAN76H189586

MODEL

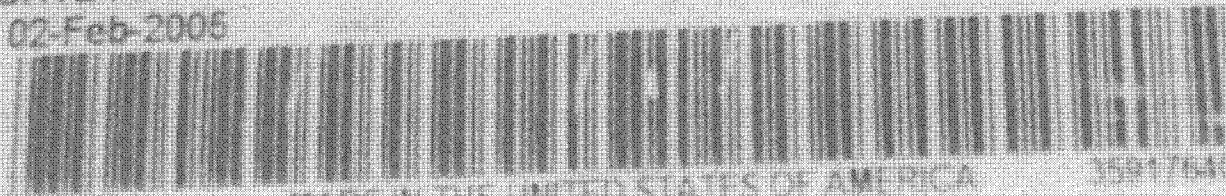
4300 SBA 4X2

W.B.

DATE MFG

02-Feb-2005

PD LOC - DATE

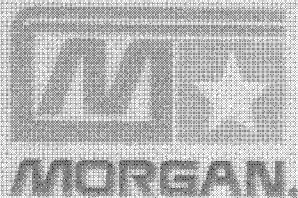


MADE IN THE UNITED STATES OF AMERICA

3591764C1

Incomplete Manufacturer's Placard

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



35 Thousand Oaks Blvd
Morgantown, PA 19543

DATE MANUFACTURED

MONTH

02

YEAR

05

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE
SAFETY STANDARDS IN EFFECT ON THE DATE SHOWN ABOVE. IT IS PRODUCED
UNDER ONE OR MORE OF THE FOLLOWING PATENT NUMBERS AND / OR
OTHER PATENTS PENDING. 4,403,804; 4,589,507; 3,986,317; 4,186,537; 4,198,187;
4,380,300; 4,380,415; 4,242,032; 4,722,109; 4,673,048.

SERIAL NO.

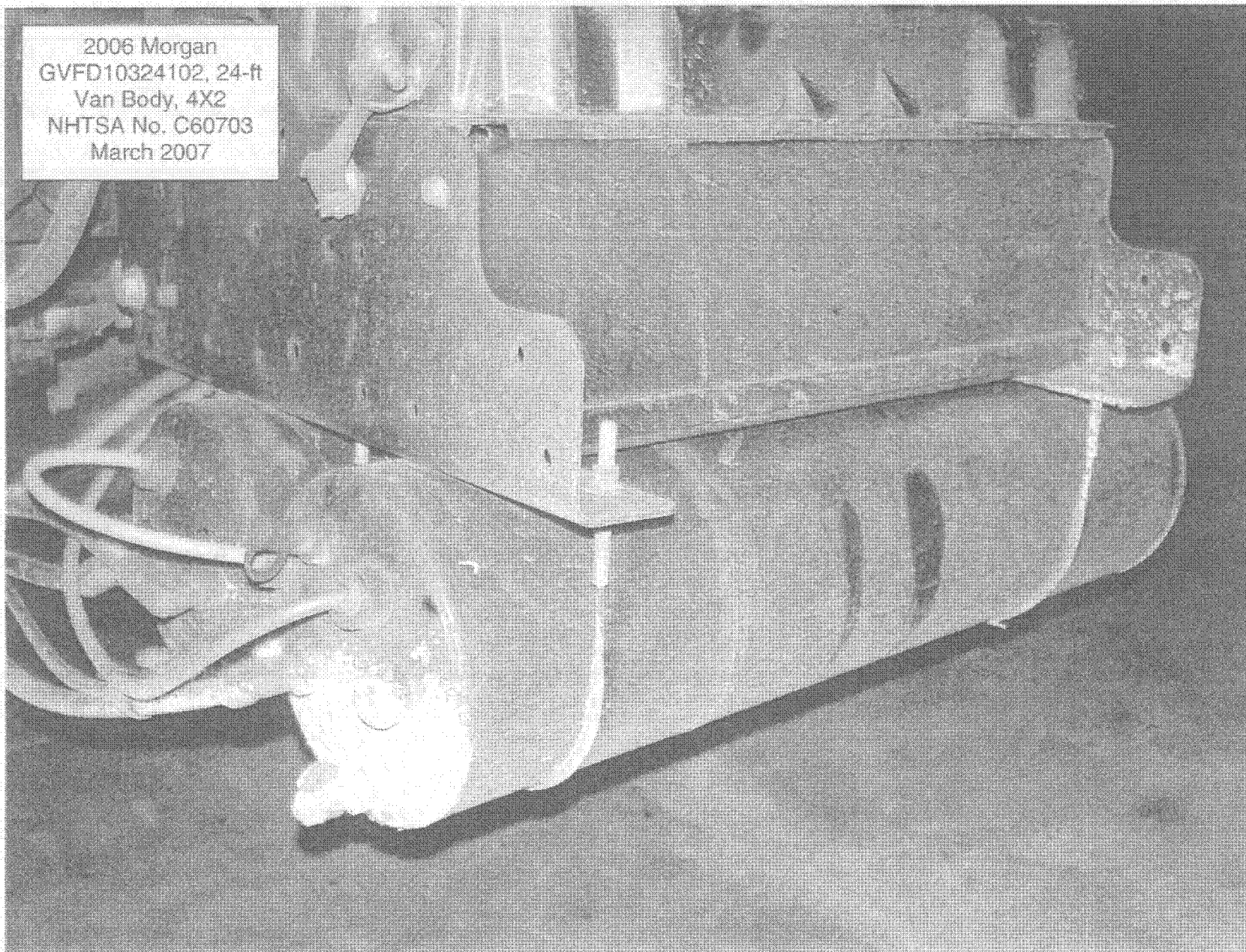
DO NOT REMOVE

MODEL NO.

GVFD10324102

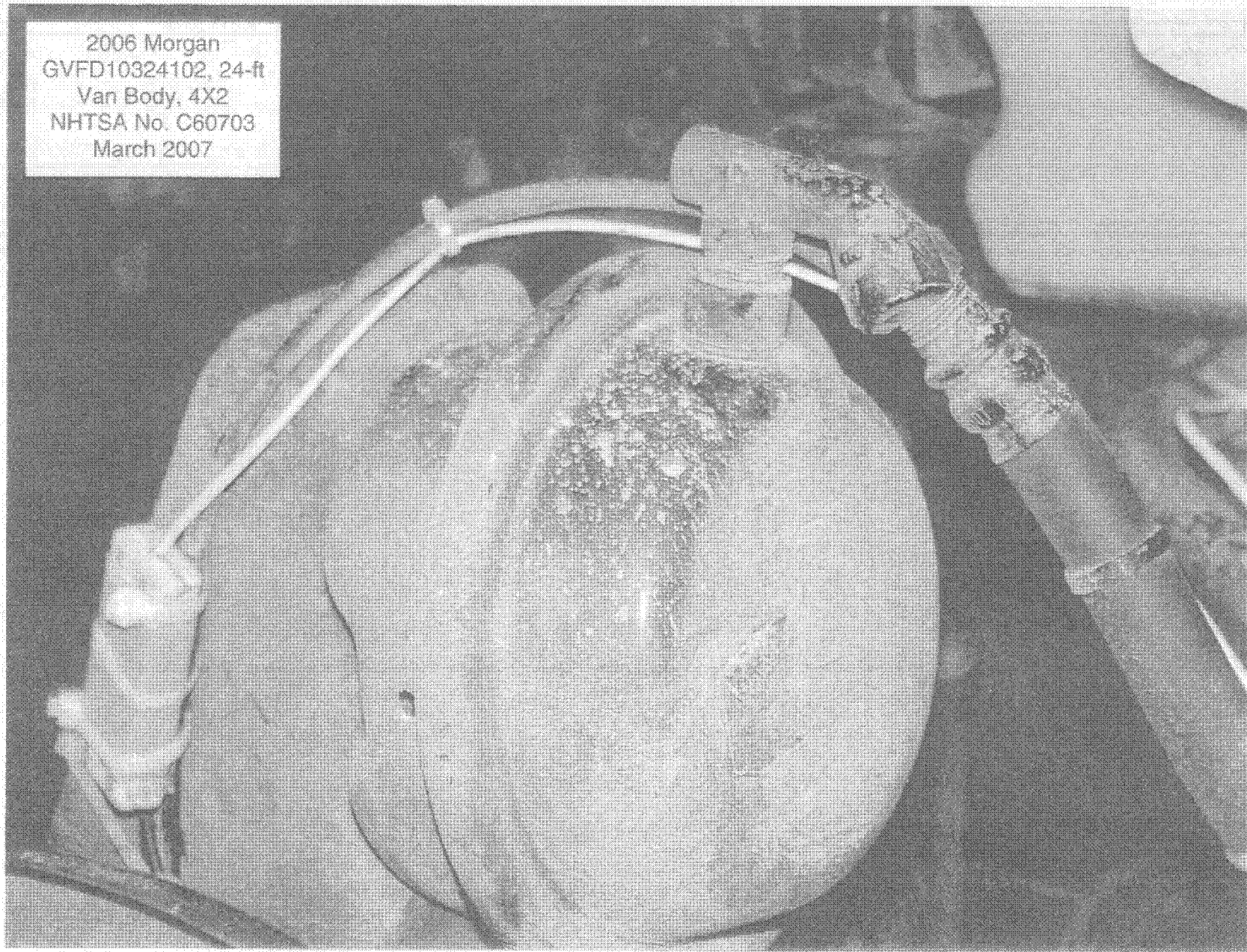
Body Manufacturer's Placard

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



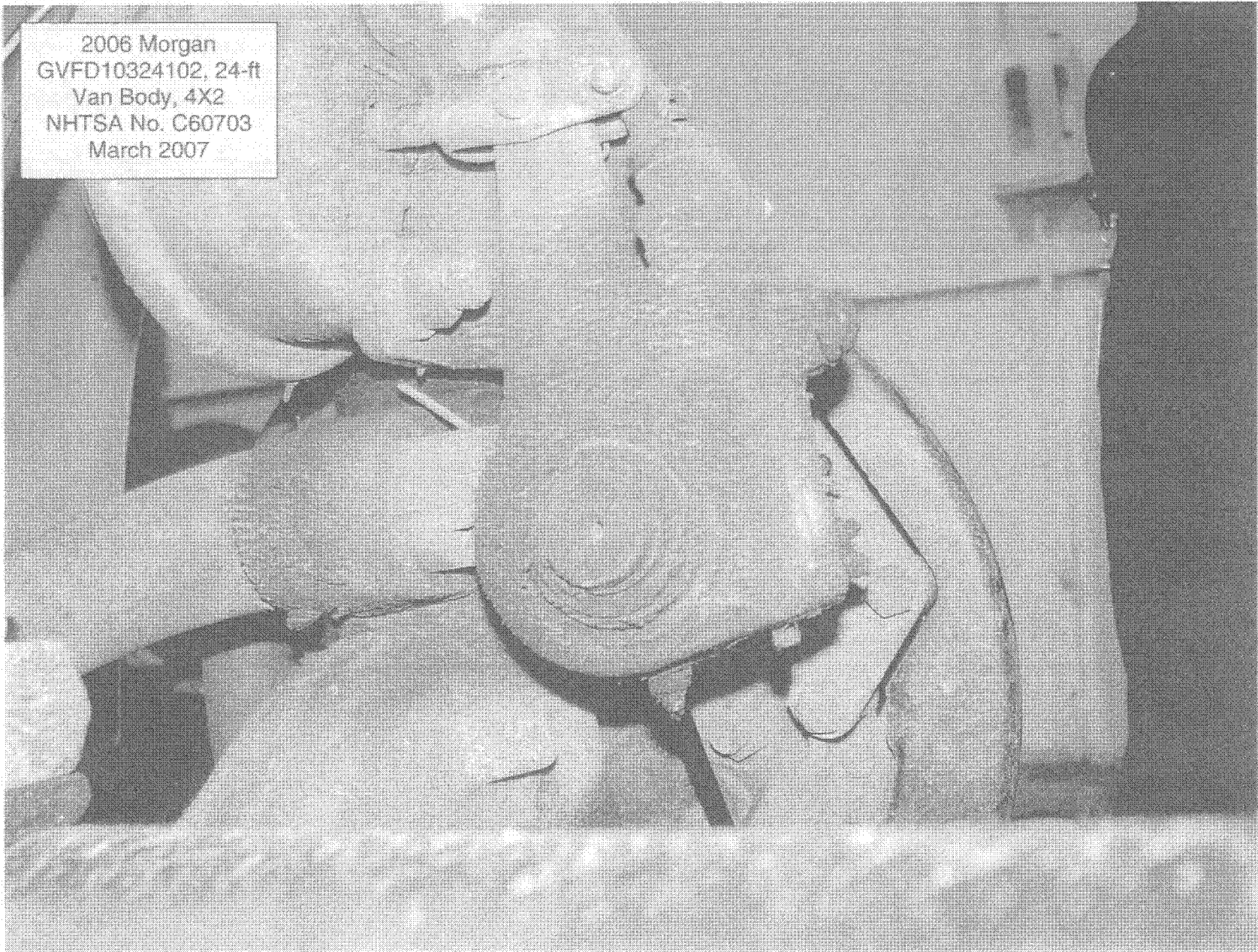
Set/Supply and Secondary (Near) and Primary (Far) Reservoirs

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



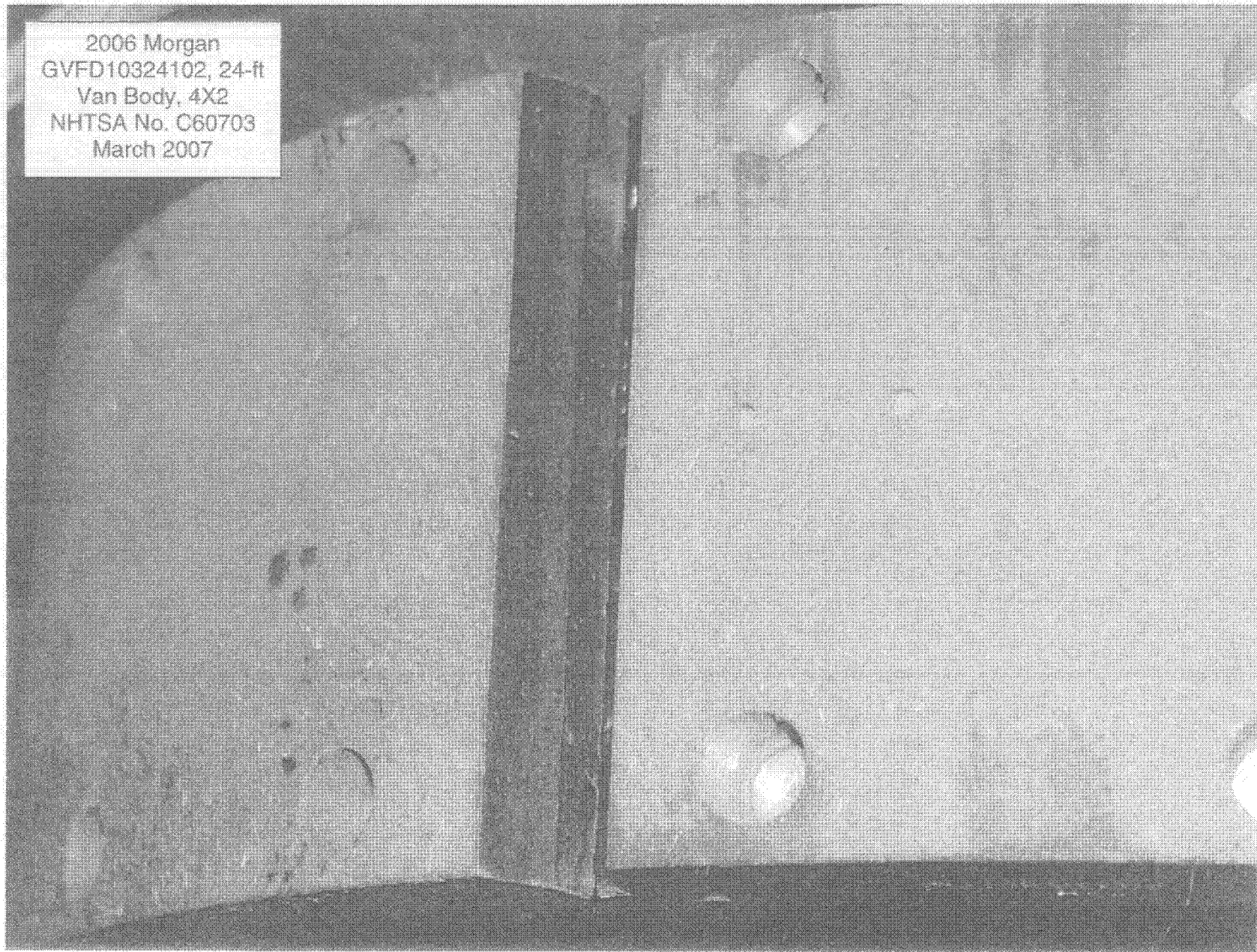
Left Front/Steer Brake Chamber

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



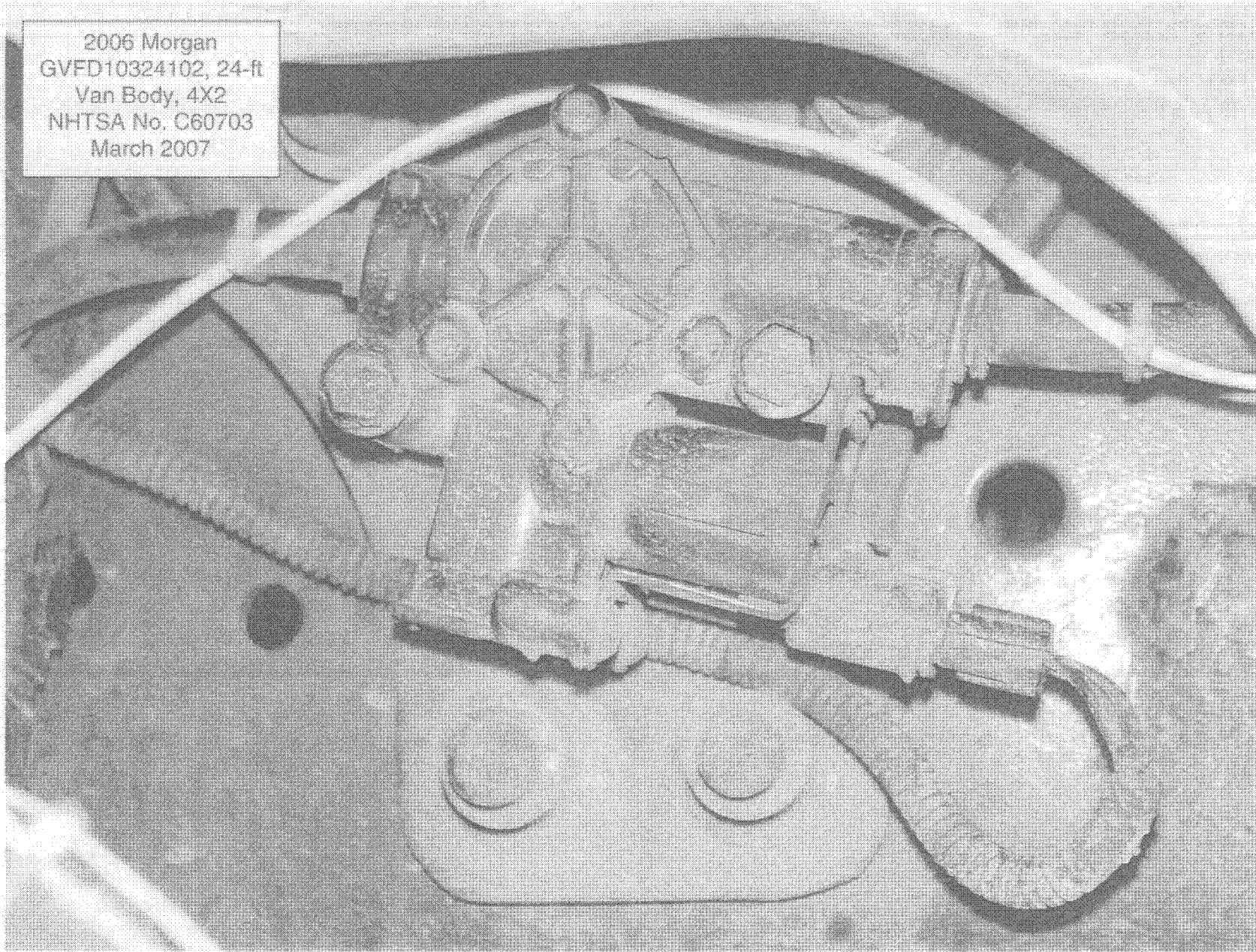
Left Front/Steer Brake Slack Adjuster

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



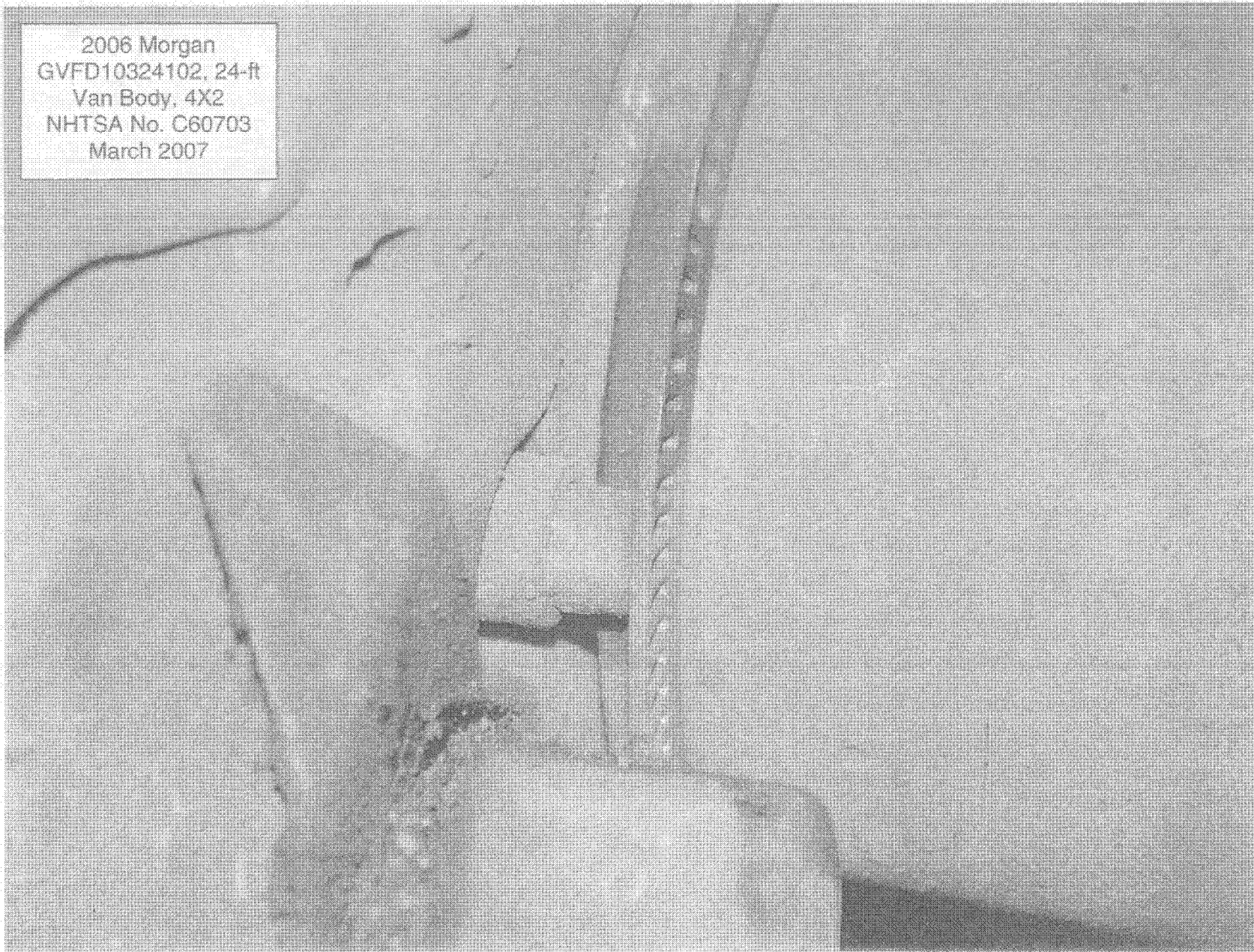
Left Front/Steer Brake Thermocouple Installation

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



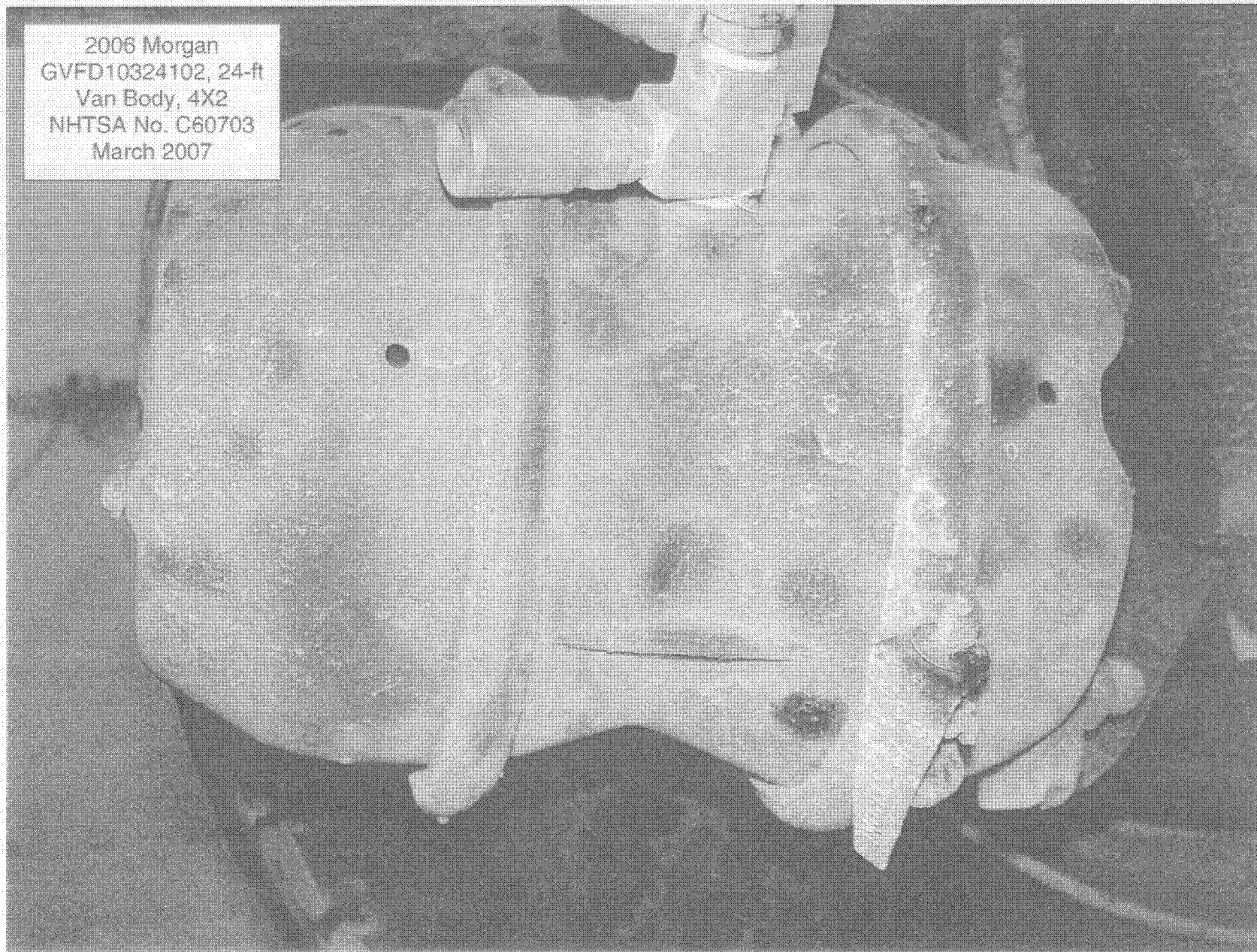
Left Front/Steer Brake ABS Modulator

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



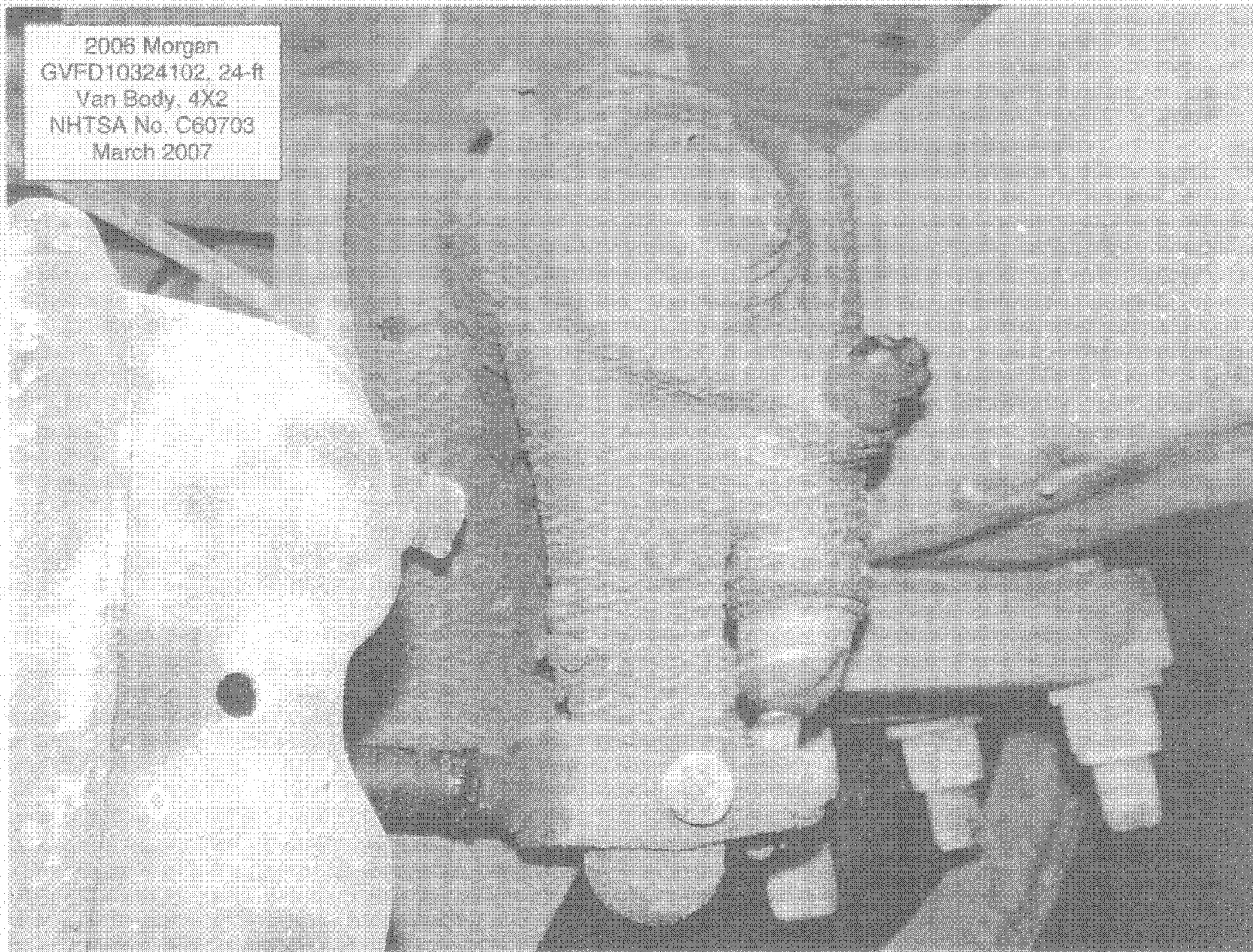
Left Front/Steer Brake ABS Wheel Speed Sensor

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



Right Rear Brake Chamber

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007

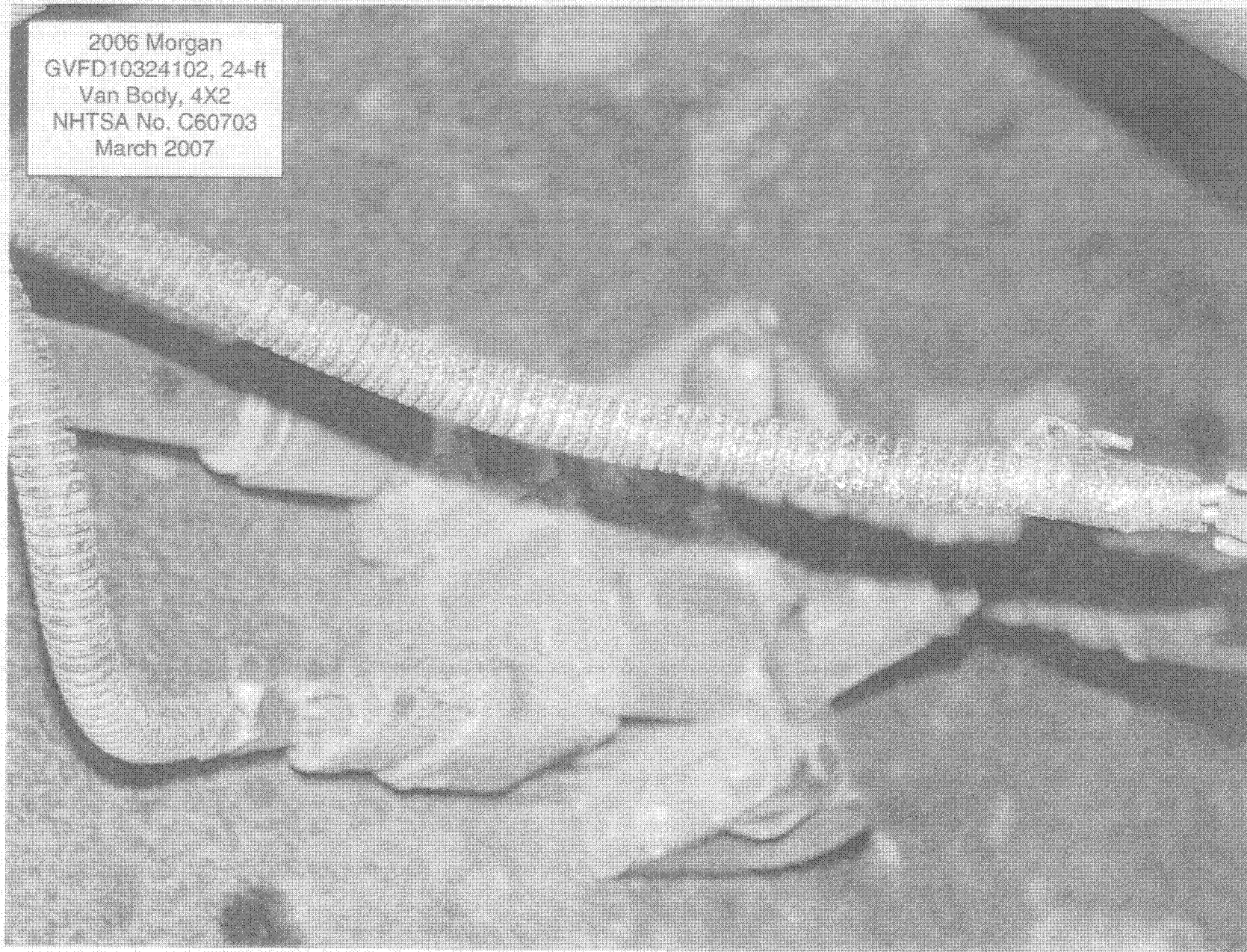


Right Rear Brake Slack Adjuster

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007

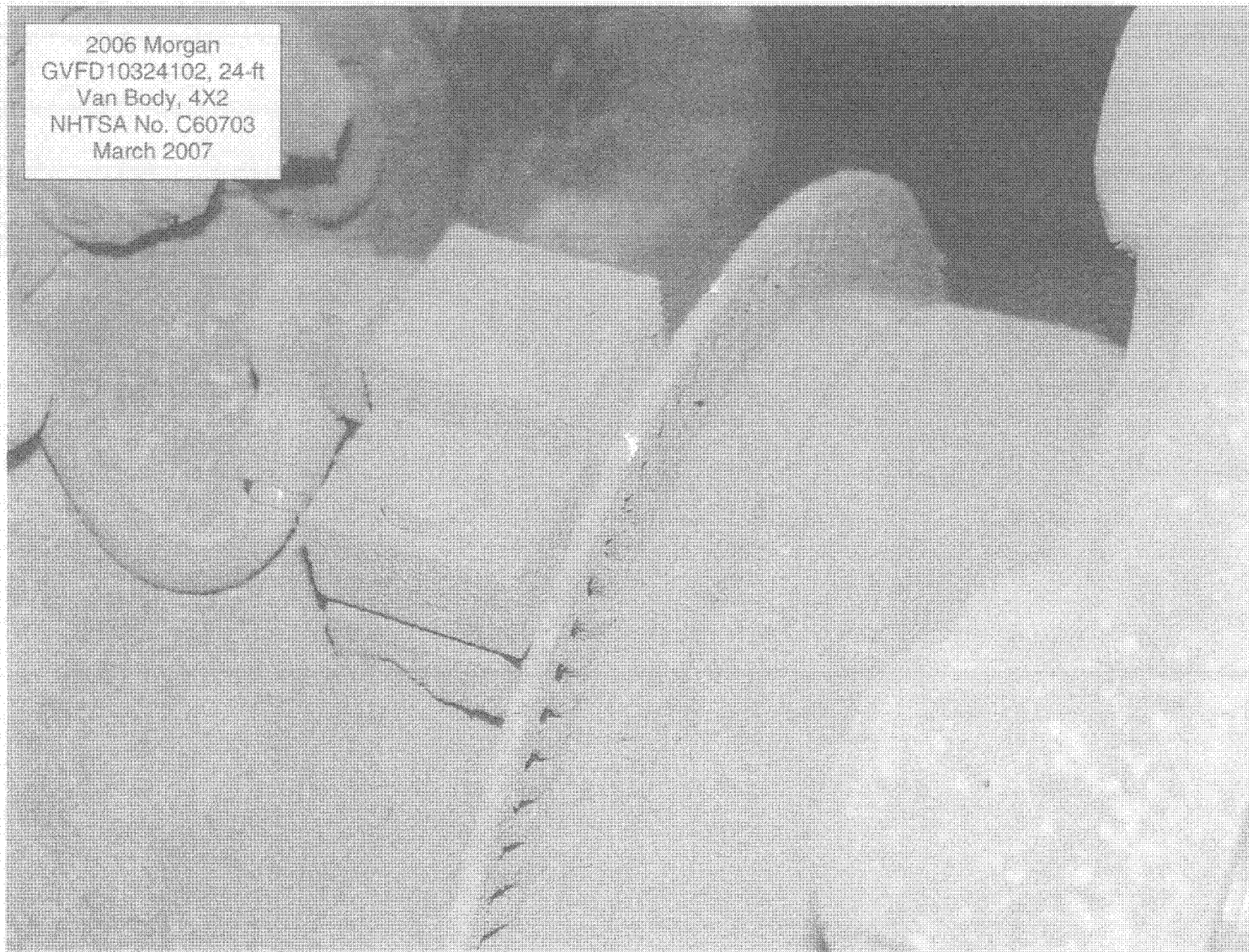
Right Rear Brake Thermocouple Installation

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



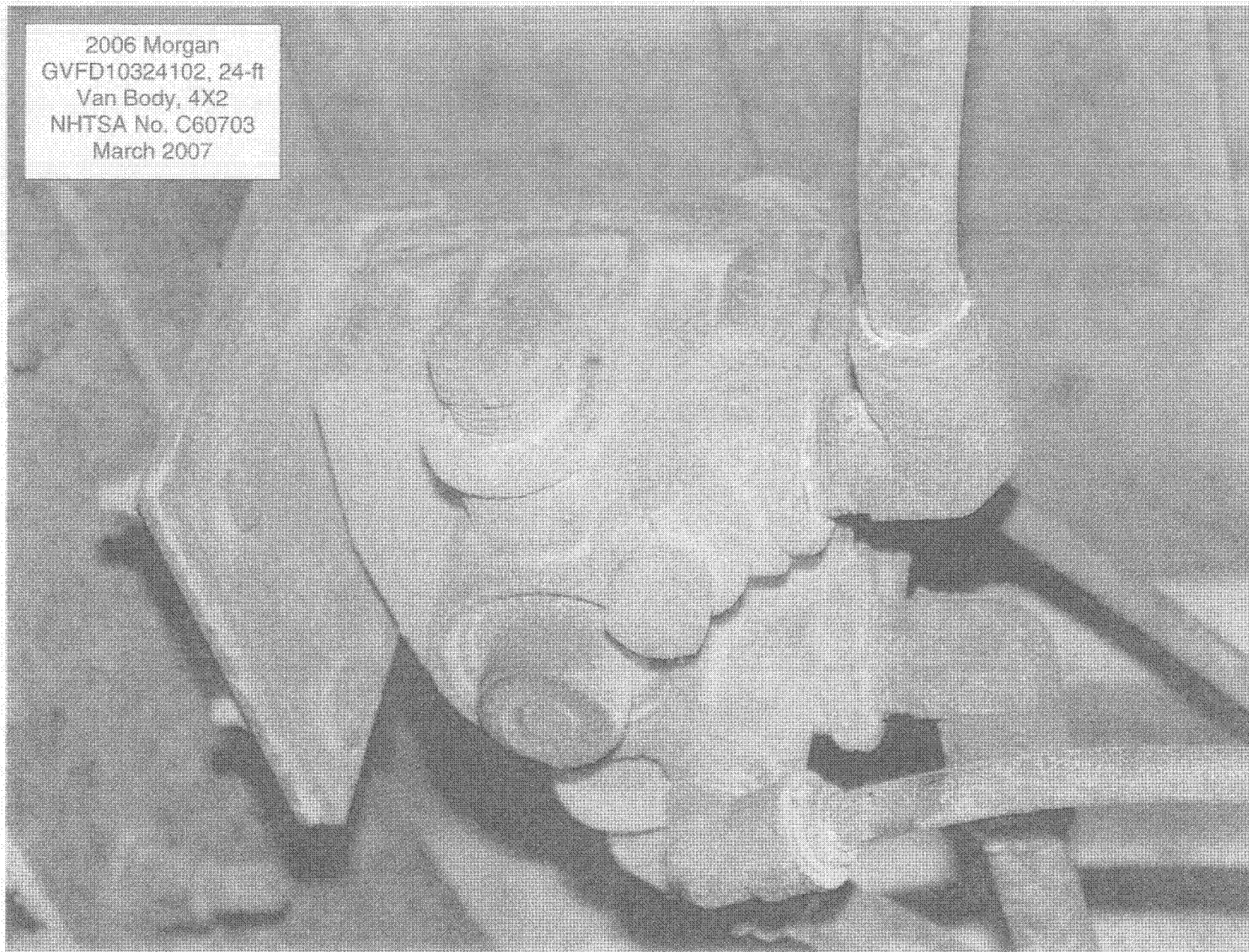
Right Rear Brake ABS Modulator

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



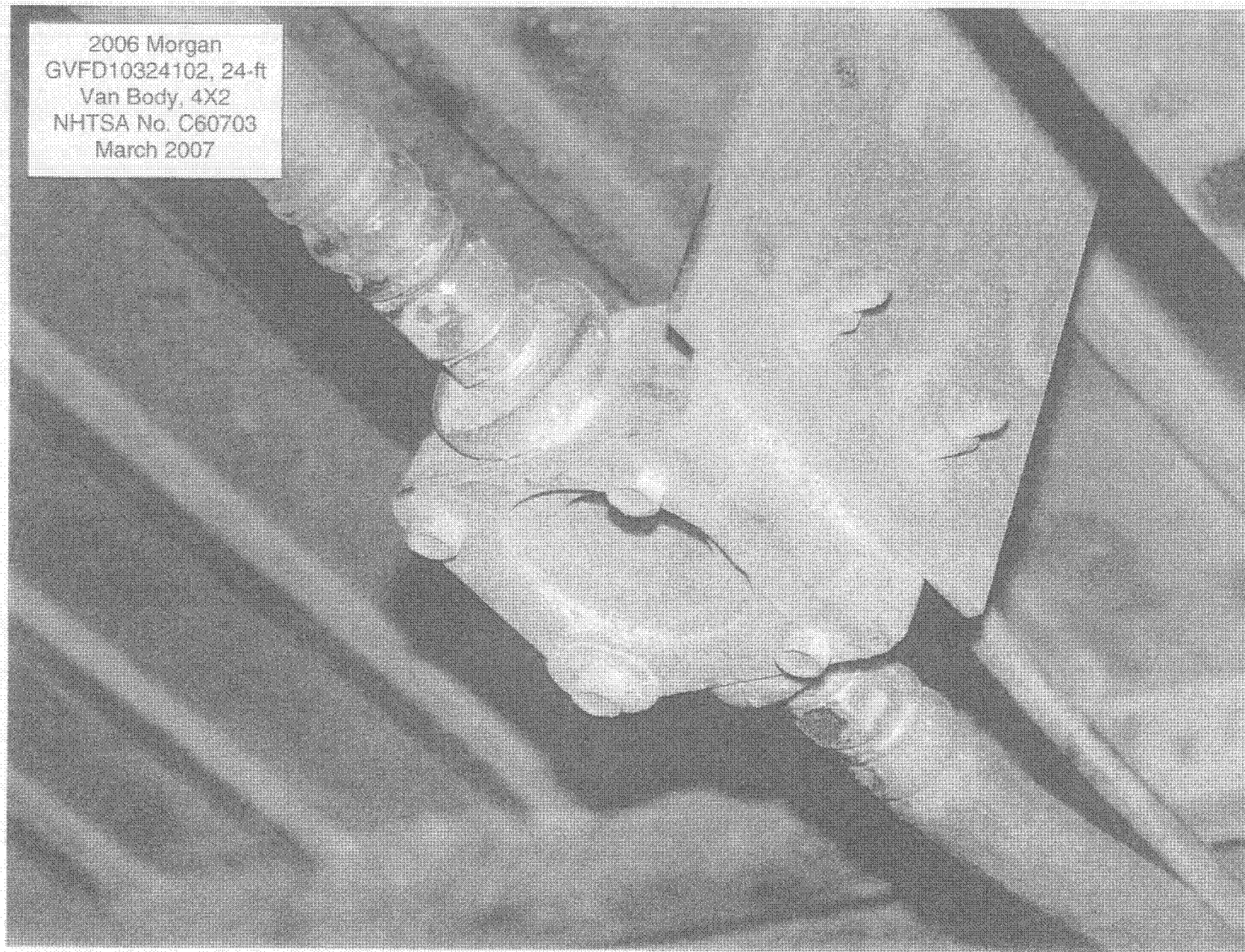
Right Rear Brake ABS Wheel Speed Sensor

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



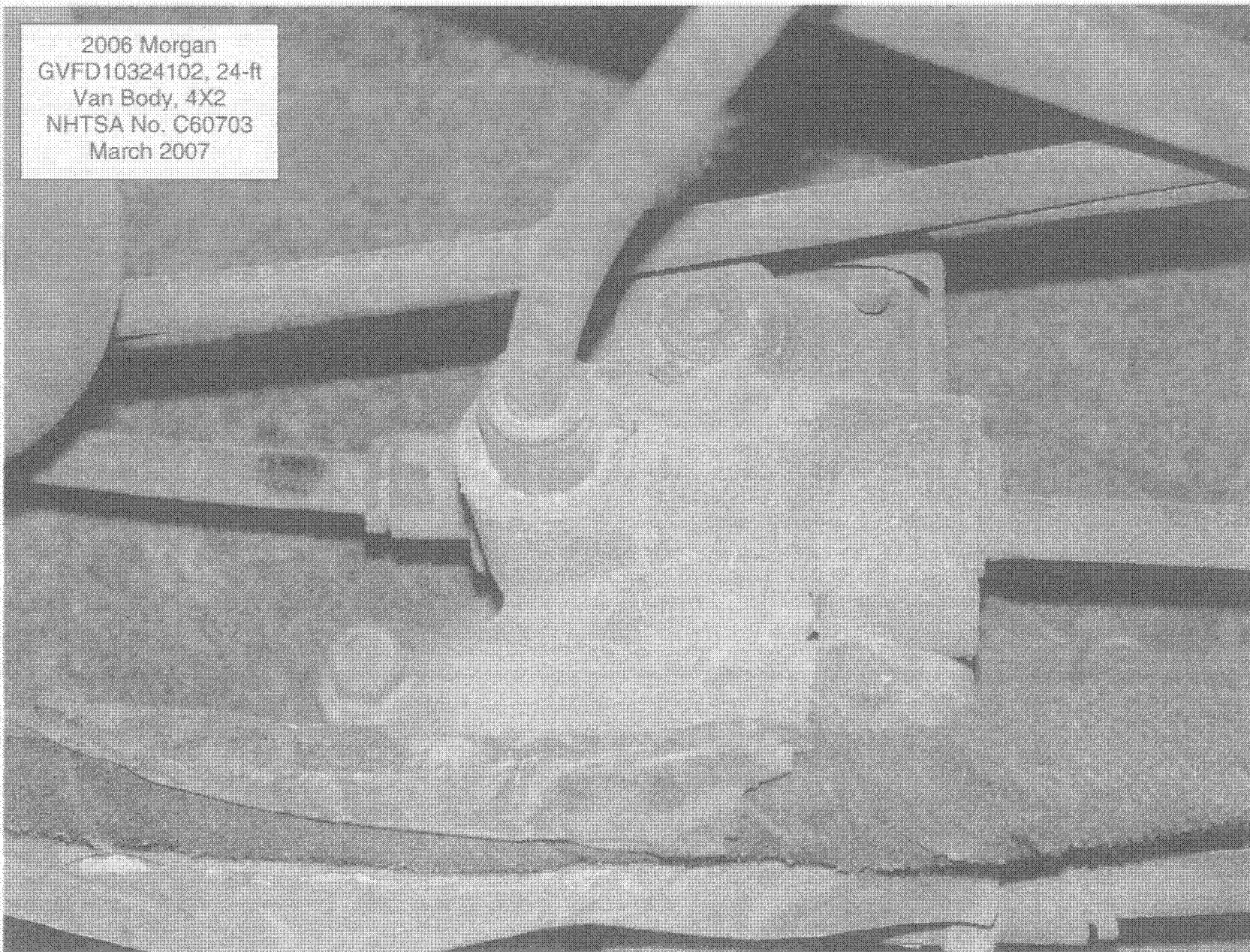
R12 Valve

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



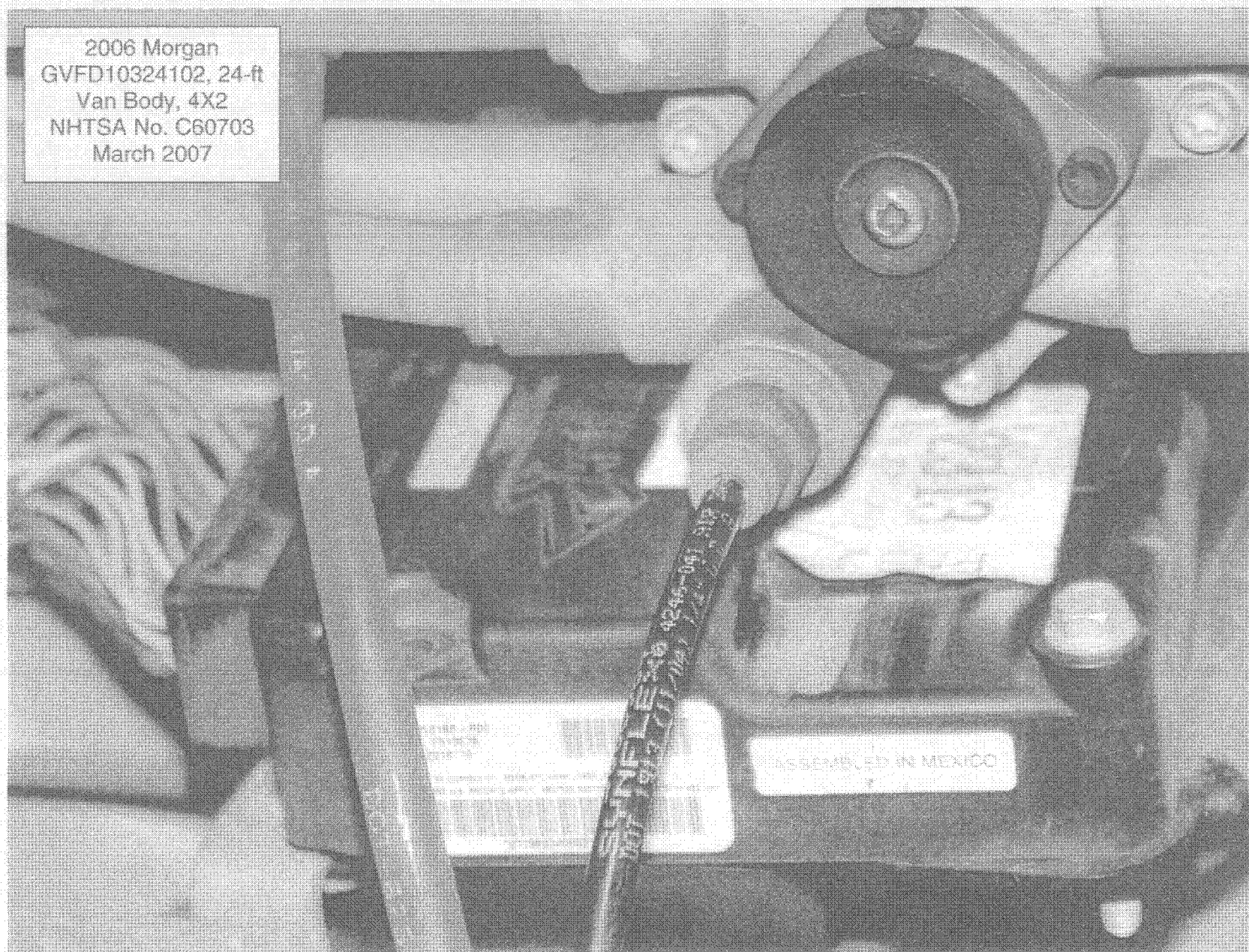
Rear Release Valve

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



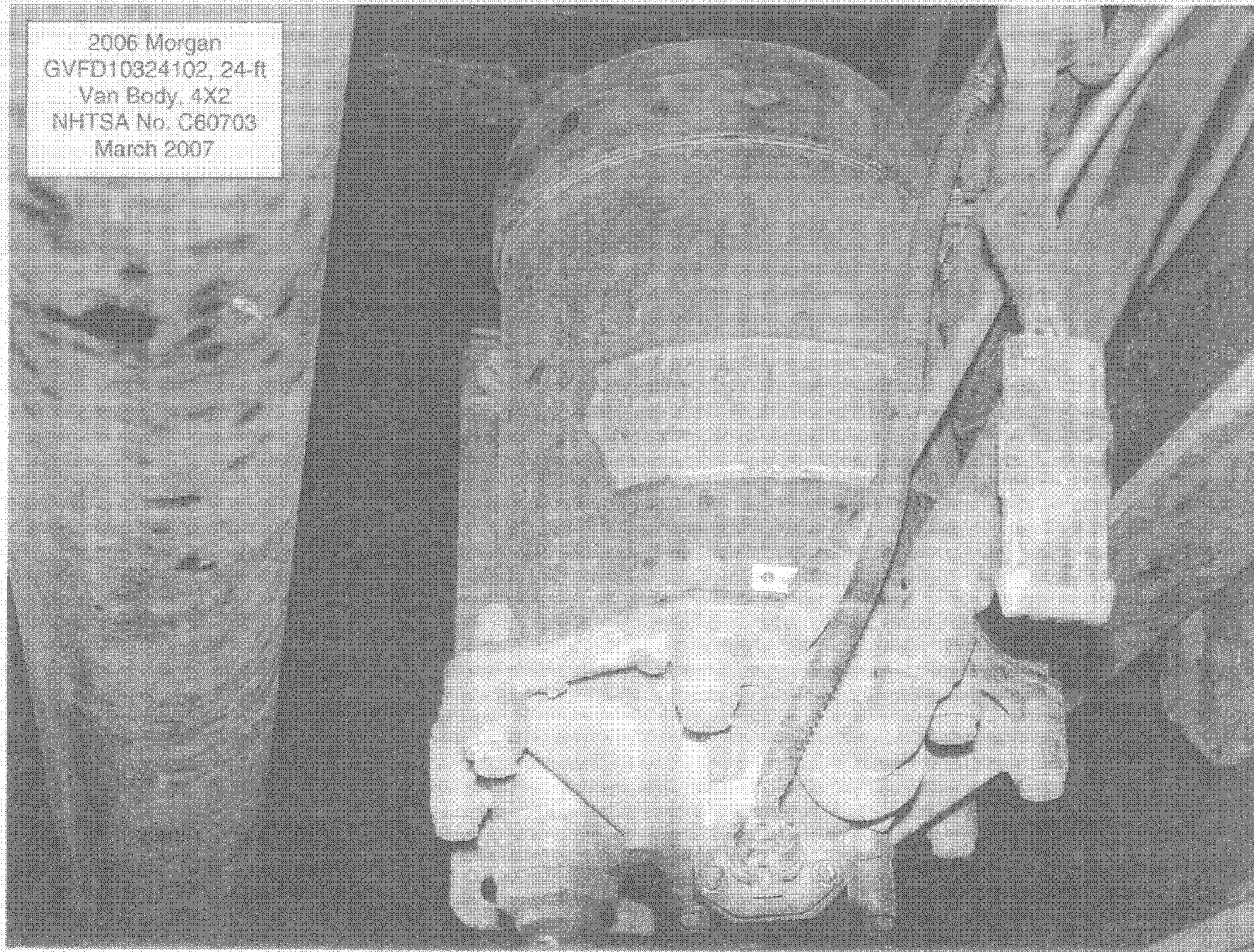
Valve (Right Side Chassis)

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



ABS ECU

2006 Morgan
GVFD10324102, 24-ft
Van Body, 4X2
NHTSA No. C60703
March 2007



Air Dryer

APPENDIX B

TEST DATA FROM REPORT GENERATOR

Vehicle: 2006 MORGAN CORP.

NHTSA NUMBER: C60703

Transportation Research Center, Inc.

10820 State Route 347

East Liberty, Ohio 43319

Make: MORGAN

Model: GVFD10324102

Body Style: CONV 24 FT VAN

Front Cold Tire Pressure: 105 (psi)

Rear Cold Tire Pressure: 105 (psi)

Date Tested: 02/21/07

DATA SHEET 10 - BURNISH AT GVWR

Testing Conditions: INV DATA, Section 0010, 02/21/07, 12:18:40

Weather Conditions: 21°F Wind: 7 mph (50°)

Start Odo.: 10239 End Odo.: 10284

Schedule:

Initial Brake Temperature Less Than 200°F

Initial Speed 40 mph to 20 mph

500 snubs with transmission in gear

Performance Requirements:

Interval between runs: Time necessary to reach speed of 40 mph and 1 mile, or 1.5 miles, whichever occurs first.

Constant decel rate: 10 ft/sec²

Pedal force adjusted to maintain constant decel.

No Lock-Up allowed longer than 0.1 sec above 10 mph

Vehicle Must stay in lane of 12 ft.

SNUB #	INIT SPD (mph)	LEFT FRONT 1BT (°F)	RIGHT FRONT 1BT (°F)	LEFT REAR 1BT (°F)	RIGHT REAR 1BT (°F)	AVG. TREADLE PRESSURE (psi)	AVG. DECEL (ft/sec ²)
		(°F)	(°F)	(°F)	(°F)	(psi)	(ft/sec ²)
1	40.04	72	77	76	78	44.98	8.94
25	40.07	253	348	471	512	75.55	10.62
50	39.62	267	536	392	361	72.49	10.05
75	40.69	263	627	438	436	60.66	10.42
100	39.59	260	331	438	457	60.66	11.27
125	39.75	255	334	432	460	56.77	10.40
150	39.95	230	296	306	322	55.67	10.55
175	40.60	229	316	319	348	50.05	9.64
200	39.84	220	308	313	343	53.45	10.46
225	40.17	226	309	317	354	51.86	10.41
250	40.02	222	311	324	373	51.70	10.33
275	40.18	230	314	322	359	49.25	10.24
300	39.88	225	300	321	358	51.35	10.53
325	40.16	226	301	318	358	51.16	10.26
350	40.74	224	303	321	363	51.17	9.80
375	39.40	219	300	325	371	48.77	10.00
400	39.95	207	274	330	367	52.42	10.15
425	40.13	201	288	348	391	49.67	9.58
450	40.73	205	295	354	399	50.10	10.16
475	40.17	206	299	352	401	52.31	10.35
500	39.44	208	293	350	399	53.15	10.60

DATA INDICATES COMPLIANCE: YRS (X) NO ()

Driver: RICHARD HERBERL

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 03/16/07

Approving Laboratory Official: JEFF SANKEY

Date: 03/20/07

Vehicle: 2006 MORGAN CORP.

NHTSA NUMBER: C60703

Transportation Research Center, Inc.

Make: MORGAN

10820 State Route 347

Model: GVFD10124102

East Liberty, Ohio 43319

Body Style: CONV. 24 FT VAN

Front Cold Tire Pressure: 105 (psi)

Rear Cold Tire Pressure: 105 (psi)

Date Tested: 02/28/07

DATA SHEET 11 - SERVICE BRAKE STOPPING DISTANCE AT GVWR

Testing Conditions: INV DATA, Section 0045, 02/28/07, 10:57:02

Weather Conditions: 31°F Wind: 8 mph 223°

Start Odo: 102873

End Odo: 102895

Schedule:

Initial Brake Temperature: +200°F

Initial Speed: 60 mph, or, if unattainable,
a speed multiple of 5.

6 stops with transmission in neutral

Performance Requirements:

One Stop with:

Stopping Distance less than: 310.0 feet

(See Table 1 of FMVSS121, "Stopping Distance Requirements")

Lock Up allowed no longer than 1 sec above 20 mph on 1 wheel

Vehicle Must stay in lane of 12 ft

STOP	INIT	LEFT	RIGHT	LEFT	RIGHT	ACTUAL	CORRECTED	MAX.	AVG	MAX.	AVG.
#	SPD	FRONT	FRONT	REAR	REAR	DISTANCE	DISTANCE	TREADLE	TREADLE	DECEL	DECEL
#	(mph)	(°F)	(°F)	(°F)	(°F)	(feet)	(feet)	(psi)	(psi)	(ft/sec ²)	(ft/sec ²)
1	60.48	92	122	141	163	273.0	268.7	108.29	99.22	24.61	12.42
2	60.20	122	153	184	199	263.8	261.9	99.45	91.54	23.00	11.80
3	60.19	122	145	182	195	277.8	276.1	104.66	97.00	23.53	12.48
4	60.84	126	151	188	194	264.0	256.8	110.61	101.88	25.02	13.00
5	61.24	133	161	196	201	279.1	267.9	99.64	91.89	21.08	12.35
6	19.82	138	164	195	194	28.4	28.9	109.42	101.37	25.20	8.65

STOP

DRIVER VEHICLE STOP COMMENTS

(Wheel Lock up - Direction of Stop - Stay in Lane)

STOP	WHEEL LOCK UP	DIRECTION OF STOP	STAY IN LANE
1	NOX	SOUTH	YES
2	NOX	SOUTH	YES
3	NOX	SOUTH	YES
4	NOX	SOUTH	YES
5	NOX	SOUTH	YES
6	NOX	SOUTH	YES

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: RICHARD HERBERL

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 03/16/07

Approving Laboratory Official: JEFF SANKEY

Date: 03/20/07

Vehicle: 2006 MORGAN CORP.

NHTSA NUMBER: C60703

Transportation Research Center, Inc.

Make: MORGAN

10820 State Route 347

Model: GVFD10324102

East Liberty, Ohio 43319

Body Style: CONV. 24-FT VAN

Front Cold Tire Pressure: 105 (psi)

Rear Cold Tire Pressure: 105 (psi)

Date Tested: 02/28/07

DATA SHEET 12 - EMERGENCY BRAKE STOPPING DISTANCE AT GVWR Primary Reservoir Failure

Testing Conditions INV DATA, Section 0050, 02/28/07, 12:13:44

Weather Conditions 34°F Wind: 7 mph 102°

Start Odo. 102895 End Odo. 102917

Schedule:

Initial Brake Temperature: <200°F

Initial Speed: 60 mph, or, if unattainable,

a speed multiple of 5

5 stops with transmission in gear

Performance Requirements:

One Stop with:

Stopping Distance less than: 613.0 feet

(See Table 1 of FMVSS121, "Stopping Distance Requirements")

Lock-Up allowed no longer than 1 sec above 20 mph on 1 wheel

Vehicle Must stay in lane of 12 ft.

STOP #	INIT SPD (mph)	LEFT		RIGHT		ACTUAL DISTANCE (feet)	CORRECTED DISTANCE (SAB 299) (feet)	MAX. TREADLE PRESSURE (psi)	AVG. TREADLE PRESSURE (psi)	MAX. DECEL (ft/sec ²)	AVG. DECEL (ft/sec ²)
		FRONT IBT (°F)	FRONT IBT (°F)	REAR IBT (°F)	REAR IBT (°F)						
1	59.65	122	139	168	165	378.8	383.3	9.33	4.55	19.25	9.98
2	58.72	140	189	185	186	320.9	335.0	21.28	11.31	25.31	10.34
3	59.72	144	202	181	187	329.5	332.6	20.46	10.45	20.12	10.87
4	60.65	148	207	181	183	333.5	326.5	17.89	9.35	21.55	10.63
5	60.02	148	204	174	175	331.6	331.4	11.19	5.79	19.45	10.96
6	60.31	139	206	158	161	324.0	320.7	21.04	11.43	21.07	11.02
7	20.89	99	163	129	141	38.2	35.0	19.76	15.36	19.38	8.32

STOP

DRIVER VEHICLE STOP COMMENTS

(Wheel Lock up - Direction of Stop - Stay in Lane)

STOP #	Wheel Lock up	Direction of Stop	Stay in Lane
1	NOX	SOUTH	YES
2	NOX	SOUTH	YES
3	NOX	SOUTH	YES
4	NOX	SOUTH	YES
5	NOX	SOUTH	YES
6	NOX	SOUTH	YES
7	NOX	SOUTH	YES

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: RICHARD HERBERL

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 03/16/07

Approving Laboratory Official: JEFF SANKEY

Date: 03/20/07

Vehicle: 2006 MORGAN CORP.

NHTSA NUMBER: C60703

Transportation Research Center, Inc.

Make: MORGAN

10820 State Route 347

Model: GVPD10224102

East Liberty, Ohio 43319

Body Style: CONV. 24 FT VAN

Front Cold Tire Pressure: 105 (psi)

Rear Cold Tire Pressure: 105 (psi)

Date Tested: 02/28/07

DATA SHEET 13 - EMERGENCY BRAKE SECONDARY STOPPING DISTANCE AT GVWR Secondary Reservoir Failure

Testing Conditions: INV DATA, Section 0051, 02/28/07, 13:49:40

Weather Conditions: 37°F Wind: 5 mph 110°

Start Odo: 102912 End Odo: 102941

Schedule:

Initial Brake Temperature: ~200°F

Initial Speed: 60 mph, or, if unattainable,

a speed multiple of 5.

6 stops with transmission in gear

Performance Requirements:

One Stop with:

Stopping Distance less than: 613.0 feet

(See Table 1 of FMVSS121, "Stopping Distance Requirements")

Lock-Up allowed no longer than 1 sec above 20 mph on 1 wheel

Vehicle Must stay in lane of 12 ft.

STOP #	INIT SPD (mph)	LEFT FRONT	RIGHT FRONT	LEFT REAR	RIGHT REAR	ACTUAL DISTANCE (feet)	CORRECTED DISTANCE (SAE 299) (feet)	MAX. TREADLE PRESSURE (psi)	AVG. TREADLE PRESSURE (psi)	MAX. DECEL (ft/sec ²)	AVG. DECEL (ft/sec ²)
		(°F)	(°F)	(°F)	(°F)						
1	59.40	127	210	139	143	388.6	396.5	110.33	100.34	18.30	8.46
2	60.87	93	177	176	184	399.1	387.7	109.80	99.79	16.85	8.43
3	60.36	77	149	178	199	443.7	436.4	109.37	97.91	16.28	7.88
4	60.34	70	127	174	207	406.3	403.7	110.96	101.00	18.91	8.04
5	60.06	69	123	176	205	416.6	415.7	108.38	98.89	18.58	7.94
6	60.30	68	128	194	215	413.5	409.1	108.95	99.40	17.08	8.40
7	20.30	98	158	123	141	44.0	42.7	96.99	88.85	15.92	6.99

STOP

DRIVER VEHICLE STOP COMMENTS

(Wheel Lock up - Direction of Stop Stay in Lane)

STOP #	WHEEL LOCK UP	DIRECTION OF STOP	STAY IN LANE
1	NOX	SOUTH	YES
2	NOX	SOUTH	YES
3	NOX	SOUTH	YES
4	NOX	SOUTH	YES
5	NOX	SOUTH	YES
6	NOX	SOUTH	YES
7	NOX	SOUTH	YES

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: RICHARD HERBERL

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 03/16/07

Approving Laboratory Official: JEFF SANKEY

Date: 03/20/07

Vehicle: 2006 MORGAN CORP.

NHTSA NUMBER: C60703

Transportation Research Center, Inc.

Make: MORGAN

10820 State Route 347

Model: GVFD101241G2

East Liberty, Ohio 43119

Body Style: CONV. 24 FT VAN

Front Cold Tire Pressure: 105 (psi)

Rear Cold Tire Pressure: 105 (psi)

Date Tested: 03/05/07

DATA SHEET 14 - EMERGENCY BRAKE CONTROL LINE FAILURE DISTANCE @GVWR Control Line Failure

Testing Conditions: INV DATA, Section 0052, 02/28/07, 16:54:38

Weather Conditions: 35°F Wind: 24 mph 292°

Start Odo: 102943

End Odo: 102993

Schedule:

Initial Brake Temperature: 200°F

Initial Speed: 60 mph, or, if unattainable,
a speed multiple of 5.

6 stops with transmission in gear

Performance Requirements:

One Stop with:

Stopping Distance less than: 611.0 feet

(See Table 1 of FMVSS121, "Stopping Distance Requirements")

Lock Up allowed no longer than 1 sec above 20 mph on 1 wheel

Vehicle Must stay in lane of 12 ft.

STOP #	INIT SPD (mph)	LEFT FRONT IBT	RIGHT FRONT IBT	LEFT REAR IBT	RIGHT REAR IBT	ACTUAL DISTANCE (feet)	CORRECTED DISTANCE (SAE 299) (feet)	MAX. TREADLE PRESSURE (psi)	AVG. TREADLE PRESSURE (psi)	MAX. DECEL (ft/sec²)	AVG. DECEL (ft/sec²)
		(°F)	(°F)	(°F)	(°F)						
1	60.14	110	190	148	165	350.6	348.9	97.49	74.46	20.60	9.43
2	60.15	119	210	134	150	332.1	330.5	104.20	80.45	21.88	9.76
3	59.77	136	190	137	146	351.5	354.2	99.76	76.33	19.35	9.55
4	60.00	184	181	171	176	336.0	336.0	105.72	81.71	18.82	9.97
5	59.84	185	176	177	183	332.9	334.6	105.06	81.05	21.77	10.04
6	20.65	189	176	181	187	37.6	35.3	105.25	89.01	19.56	7.34

STOP

DRIVER VEHICLE STOP COMMENTS

#	(Wheel Lock up	Direction of Stop	Stay in Lane)
1	NOX	SOUTH	YES
2	NOX	SOUTH	YES
3	NOX	SOUTH	YES
4	NOX	SOUTH	YES
5	NOX	SOUTH	YES
6	NOX	SOUTH	YES

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: RICHARD HERRBERG

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 03/16/07

Approving Laboratory Official: JEFF SANKEY

Date: 03/20/07

Vehicle: 2004 MORGAN CORP.

NHSTA NUMBER: C60703

Transportation Research Center, Inc.

Make: MORGAN

10820 State Route 347

Model: GVFD10324102

East Liberty, Ohio 43319

Body Style: CONV. 24 FT VAN

Front Cold Tire Pressure: 105 (psi)

Rear Cold Tire Pressure: 105 (psi)

Date Tested: 03/05/07

DATA SHEET 15 - PARKING BRAKE TEST (GRADE HOLDING) AT GVWR

Testing Conditions: INV DATA, Section 0065, 03/05/07, 16:19.32

Parking brake: N/A

Non service type: N/A

Service type: HAND OPERATED

Weather Conditions: 35°F Wind: 18 mph 304°

Start Odo: 102996 End Odo: 102997

Test Weight: Total: 3290lbs Front: 1200lbs Rear: 2090lbs

Schedule:Initial Brake Temperature: 200°F or (Ambient temp.
if non service brake type materials)

Loaded to GVWR with transmission in neutral

Drive onto 20% slope in forward and reverse directions.

Performance Requirements:

Up to Three Applies in each direction:

Parking brake must hold the vehicle stationary

in both directions for 5 minutes each.

NOTE: For vehicles with parking brake systems not utilizing the service brake friction elements, the friction elements of such systems are to be burnished prior to parking brake tests according to the manufacturer's published recommendation as furnished to the purchaser. If no recommendations are furnished, test the system in an unburnished condition. If recommendations are furnished, record method used.

	LEFT	RIGHT	AVG	
	REAR	REAR	REAR	
APPLY	1BT	1BT	1BT	DRIVER VEHICLE STOP COMMENTS
#	(°F)	(°F)	(°F)	(Direction of Stop (Up/Down) - Brake holds/fails)
1	143	171	157.0	DOWNHILL 20% Holds
*				

Is brake system indicator lamp activated: YES (X) NO ()

COMMENTS: * ENCOUNTERED COMPUTER LOGGING PROBLEM DURING UPHILL TEST.
NOT RECORDED. HOWEVER, UPHILL TEST WAS IN COMPLIANCE; HELD.

Static Retardation Tests not required, therefore, Data Sheet 16 not included.

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: RICHARD HERBERL

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 03/16/07

Approving Laboratory Official: JEFF SANKBY

Date: 03/20/07

Vehicle: 2006 MORGAN CORP.

NHTSA NUMBER: C60703

Transportation Research Center, Inc.

Make: MORGAN

10920 State Route 347

Model: GVPD10124102

East Liberty, Ohio 43419

Body Style: CONV. 24 FT VAN

Front Cold Tire Pressure: 105 (psi)

Rear Cold Tire Pressure: 105 (psi)

Date Tested: 01/06/07

DATA SHEET 17 - STABILITY AND CONTROL AT LLVW

Testing Conditions INV DATA, Section 0040, 01/06/07, 14:09:04

Weather Conditions: 21°F Wind: 4 mph 147° Start Odo.: 103008 End Odo.: 103009

Schedule:

Initial Brake Temperature 200 F

Initial Speed 24.0 mph LLVW

4 stops with transmission in neutral

Performance Requirements:

Three Stops with:

Highest possible constant speed at which vehicle
can be driven through 200 feet of arc of low
Mu 500 ft radius curve.

Vehicle Must stay in lane of 12 feet

STOP #	INIT SPD (mph)	LEFT FRONT IBT	RIGHT FRONT IBT	LEFT REAR IBT	RIGHT REAR IBT	ACTUAL DISTANCE (feet)	CORRECTED DISTANCE (SAK 299) (feet)	MAX. TREADLE PRESSURE (psi)	AVG. TREADLE PRESSURE (psi)	MAX. DECEL (ft/sec ²)	AVG. DECEL (ft/sec ²)
		(°F)	(°F)	(°F)	(°F)						
1	24.03	84	106	164	170	107.2	107.0	112.02	97.56	15.95	6.11
2	24.05	85	106	160	161	71.9	71.6	108.57	93.46	16.81	2.47
3	24.87	86	106	157	155	110.5	102.9	108.73	94.22	17.63	5.47
4	24.00	88	107	155	156	66.0	66.0	99.50	98.51	17.15	2.86

STOP

DRIVER VEHICLE STOP COMMENTS

(Wheel lock up Direction of Stop Stay in Lane)

#	(Wheel lock up)	Direction of Stop	Stay in Lane
1	NO	EAST	YES
2	NO	EAST	YES
3	NO	EAST	YES
4	NO	EAST	YES

Corrected Distances are used to determine shortest stopping distance.

COMMENTS: MAXIMUM DRIVE THROUGH SPEED = 32 MPH.

TARGET SPEED IS 75% OF 32 MPH = 24 MPH.

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: RICHARD HERBERL

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 01/16/07

Approving Laboratory Official: JEFF SANKEY

Date: 01/26/07

Vehicle: 2006 MORGAN CORP.

NHTSA NUMBER: C60703

Transportation Research Center, Inc

Make: MORGAN

10820 State Route 347

Model: GVPD10324102

East Liberty, Ohio 43319

Body Style: CONV. 24 FT VAN

Front Cold Tire Pressure: 105 (psi)

Rear Cold Tire Pressure: 105 (psi)

Date Tested: 03/08/07

DATA SHEET 18 - SERVICE BRAKE STOPPING DISTANCE AT LLVW

Testing Conditions: INV DATA, Section 6046, 03/08/07, 14:11:26

Weather Conditions: 34°F Wind: 1 mph 198°

Start Odo: 103050

End Odo: 103067

Schedule:

Initial Brake Temperature: 200°F

Initial Speed: 60 mph, or, if unattainable,
a speed multiple of 5.

6 stops with transmission in gear

Performance Requirements:

One Stop with:

Stopping Distance less than: 335.0 feet

(See Table 1 of FMVSS121, "Stopping Distance Requirements")

Lock Up allowed no longer than 1 sec above 20 mph on 1 wheel

Vehicle Must stay in lane of 12 ft.

STOP #	INIT SPD (mph)	LEFT FRONT	RIGHT FRONT	LEFT REAR	RIGHT REAR	ACTUAL DISTANCE (feet)	CORRECTED DISTANCE (SAE 299) (feet)	MAX. TREADLE PRESSURE (psi)	AVG. TREADLE PRESSURE (psi)	MAX. DECEL (ft/sec ²)	AVG. DECEL (ft/sec ²)
		IBT (°F)	IBT (°F)	IBT (°F)	IBT (°F)						
1	59.73	110	127	155	149	184.1	185.8	105.17	85.97	31.45	17.93
2	59.88	125	138	156	154	184.0	184.7	107.33	86.00	35.86	19.16
3	61.01	145	166	164	160	187.2	181.1	107.25	83.67	37.84	18.37
4	60.83	160	189	176	170	194.8	189.6	105.10	81.05	36.09	18.13
5	59.37	147	175	167	164	177.2	181.0	106.32	87.01	33.51	19.46
6	20.86	150	189	174	164	26.1	24.3	107.96	65.74	30.38	13.83

STOP

DRIVER VEHICLE STOP COMMENTS

(Wheel Lock up - Direction of Stop - Stay in Lane)

STOP #	WHEEL LOCK UP	DIRECTION OF STOP	STAY IN LANE
1	NOX	SOUTH	YES
2	NOX	SOUTH	YES
3	NOX	SOUTH	YES
4	NOX	SOUTH	YES
5	NOX	SOUTH	YES
6	RRX	SOUTH	YES

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: RICHARD HERBERL

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 03/16/07

Approving Laboratory Official: JEFF SANKEY

Date: 03/20/07

Vehicle: 2006 MORGAN CORP
Make: MORGAN
Model: GVFD10324102
Body Style: CONV. 24 FT VAN
Front Cold Tire Pressure: 105 (psi)
Rear Cold Tire Pressure: 105 (psi)

NHTSA NUMBER: C60703

Transportation Research Center, Inc.
10820 State Route 347
East Liberty, Ohio 43319

Date Tested: 03/08/07

DATA SHEET 19 - EMERGENCY BRAKE STOPPING DISTANCE AT LLVW Primary Reservoir Failure

Testing Conditions: INV DATA, Section 0053, 03/08/07, 14:44:21

Weather Conditions: 35°F Wind: 7 mph 95°

Start Odo: 103067 End Odo: 103084

Schedule:

Initial Brake Temperature: <200°F
Initial Speed: 60 mph, or, if unattainable,
a speed multiple of 5.
6 stops with transmission in gear

Performance Requirements:

One Stop with:
Stopping Distance less than: 613.0 feet
(See Table 1 of FMVSS121, "Stopping Distance Requirements")
Lock-Up allowed no longer than 1 sec above 20 mph on 1 wheel
Vehicle Must stay in lane of 12 ft.

STOP #	INIT SPD (mph)	LEFT FRONT IBT (°F)	RIGHT FRONT IBT (°F)	LEFT REAR IBT (°F)	RIGHT REAR IBT (°F)	ACTUAL DISTANCE (feet)	CORRECTED DISTANCE (SAE 299) (feet)	MAX. TREADLE PRESSURE (psi)	AVG. TREADLE PRESSURE (psi)	MAX. DECEL (ft/sec²)	AVG. DECEL (ft/sec²)
1	57.67	123	148	146	138	181.6	196.6	23.29	15.60	37.58	17.28
2	56.36	136	177	159	128	168.4	190.9	20.92	14.23	35.53	15.94
3	58.93	144	197	154	122	186.4	193.3	22.36	13.71	35.36	16.61
4	59.59	135	183	150	107	181.6	184.1	20.08	12.64	32.24	17.94
5	59.94	131	183	147	115	180.2	180.6	21.47	13.58	35.31	17.98
6	20.32	136	200	151	120	25.1	24.3	20.38	16.01	29.82	11.09

STOP #	DRIVER VEHICLE STOP COMMENTS			
	(Wheel) Lock up	Direction of Stop - Stay in Lane)		
1		RRX	SOUTH	YES
2		RRX	SOUTH	YES
3		RRX	SOUTH	YES
4		NOX	SOUTH	YES
5		RRX	SOUTH	YES
6		NOX	SOUTH	YES

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: RICHARD HERBERL Observer: NONE
Recorded Data Processed by: CHUCK JENKINS Date: 03/16/07
Approving Laboratory Official: JEFF SANKEY Date: 03/20/07

Vehicle: 2006 MORGAN CORP.

NHTSA NUMBER: C60703

Transportation Research Center, Inc.

Make: MORGAN

10820 State Route 347

Model: GVPD10124102

East Liberty, Ohio 43319

Body Style: CONV. 24-FT VAN

Front Cold Tire Pressure: 105 (psi)

Rear Cold Tire Pressure: 105 (psi)

Date Tested: 03/08/07

DATA SHEET 20 - EMERGENCY BRAKE SECONDARY STOPPING DISTANCE AT LLVW Secondary Reservoir Failure

Testing Conditions INV DATA, Section 0054, 03/08/07, 15:26:21

Weather Conditions 36°F Wind: 6 mph 54°

Start Odo: 103084

End Odo: 103164

Schedule:

Initial Brake Temperature: 200°F

Initial Speed: 60 mph, or, if unattainable,

a speed multiple of 5.

6 stops with transmission in gear

Performance Requirements:

One Stop with:

Stopping Distance less than: 613.0 feet

(See Table 1 of FMVSS121, "Stopping Distance Requirements")

Lock-Up allowed no longer than 1 sec above 20 mph on 1 wheel.

Vehicle Must stay in lane of 12 ft.

STOP #	INIT SPD (mph)	LEFT FRONT	RIGHT FRONT	LEFT REAR	RIGHT REAR	ACTUAL DISTANCE (feet)	CORRECTED DISTANCE (SAE 299) (feet)	MAX. TREADLE PRESSURE (psi)	AVG. TREADLE PRESSURE (psi)	MAX. DECEL (ft/sec ²)	AVG. DECEL (ft/sec ²)
		(°F)	(°F)	(°F)	(°F)						
1	59.85	114	161	128	103	303.2	304.8	105.71	80.23	23.47	11.76
2	59.65	97	144	176	154	305.9	309.5	108.11	80.92	23.65	11.65
3	59.77	86	131	208	185	303.1	305.5	106.87	78.35	22.87	11.62
4	60.07	72	111	192	174	306.1	305.4	109.61	79.44	24.01	11.22
5	60.28	66	102	190	174	298.9	296.2	108.40	82.13	21.66	11.50
6	21.08	62	94	177	167	44.3	39.9	107.19	92.55	22.25	8.79

STOP #

DRIVER VEHICLE STOP COMMENTS

#	(Wheel Lock up - Direction of Stop Stay in Lane)		
	NOX	SOUTH	YES
1			
2			
3			
4			
5			
6			

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: RICHARD HERBERL

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 03/16/07

Approving Laboratory Official: JEFF SANKEY

Date: 03/20/07

Vehicle: 2006 MORGAN CORP

NHTSA NUMBER: C60703

Transportation Research Center, Inc.

Make: MORGAN

10820 State Route 347

Model: GVFD10124102

East Liberty, Ohio 43319

Body Style: CONV. 24-FT VAN

Front Cold Tire Pressure: 105 (psi)

Rear Cold Tire Pressure: 105 (psi)

Date Tested: 03/08/07

DATA SHEET 21 - EMERGENCY BRAKE CONTROL LINE FAILURE DISTANCE @LLVW
Control Line Failure

Testing Conditions: INV DATA, Section 0055, 03/08/07, 16:45:14

Weather Conditions: 37°F Wind: 6 mph 82°

Start ODS: 103106 End ODS: 103177

Schedule:

Initial Brake Temperature: 200°F

Initial Speed: 60 mph, or, if unattainable,
a speed multiple of 5

6 stops with transmission in gear

Performance Requirements:

One Stop with:

Stopping Distance less than: 611.0 feet

(See Table 1 of FMVSS121, "Stopping Distance Requirements")

Lock-Up allowed no longer than 1 sec above 20 mph on 1 wheel

Vehicle Must stay in lane of 12 ft.

STOP #	INIT SPD (mph)	LEFT FRONT	RIGHT FRONT	LEFT REAR	RIGHT REAR	ACTUAL DISTANCE (feet)	CORRECTED DISTANCE (SAE 299) (feet)	MAX. TREADLE PRESSURE (psi)	AVG		MAX. DECEL (ft/sec ²)	AVG. DECEL (ft/sec ²)
		IBT (°F)	IBT (°F)	IBT (°F)	IBT (°F)				TREADLE PRESSURE (psi)	DECEL (ft/sec ²)		
1	59.20	79	112	149	142	181.5	186.4	103.80	86.40	38.04	16.76	
2	60.09	116	169	162	149	188.4	187.8	104.74	86.14	27.35	16.90	
3	60.44	128	196	156	138	192.1	189.4	104.30	86.21	35.43	17.03	
4	60.18	129	191	145	118	184.5	183.4	107.04	89.26	35.52	18.29	
5	59.31	126	198	137	118	179.0	183.1	105.49	81.79	36.94	17.29	
6	20.05	116	182	123	109	27.6	27.5	103.52	87.33	31.21	11.72	

STOP #	DRIVER VEHICLE STOP COMMENTS		
	(Wheel Lock up)	Direction of Stop	Stay in lane)
1		RRX	SOUTH
2		RRX	SOUTH
3		RRX	SOUTH
4		NOX	SOUTH
5		NOX	SOUTH
6		NOX	SOUTH

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: RICHARD HERBERL

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 03/16/07

Approving Laboratory Official: JEFF SANKEY

Date: 03/20/07

Vehicle: 2006 MORGAN CORP.

NHTSA NUMBER: C60703

Transportation Research Center, Inc

Make: MORGAN

10820 State Route 347

Model: GVFD10324102

East Liberty, Ohio 43319

Body Style: CONV. 24 FT VAN

Front Cold Tire Pressure: 105 (psi)

Rear Cold Tire Pressure: 105 (psi)

Date Tested: 03/08/07

DATA SHEET 22 - PARKING BRAKE TEST (GRADE HOLDING) AT LLVW

Testing Conditions: INV DATA, Section 0066, 03/08/07, 17:43:52

Parking brake: N/A

Non-service type: N/A

Service type: HAND-OPERATED

Weather Conditions: 47°F Wind: 6 mph 96%

Start Odo.: 103129 End Odo.: 103129

Test Weight: Total: 18070lbs

Front: 7860lbs

Rear: 10210lbs

Schedule:Initial Brake Temperature <200°F or (Ambient temp.
if non-service brake type materials)

Loaded to GVWR with transmission in neutral

Drive onto 20% slope in forward and reverse directions.

Performance Requirements:

Up to Three Applies in each direction:

Parking brake must hold the vehicle stationary
in both directions for 5 minutes each.

NOTE: For vehicles with parking brake systems not utilizing the service brake friction elements, the friction elements of such systems are to be burnished prior to parking brake tests according to the manufacturer's published recommendation as furnished to the purchaser. If no recommendations are furnished, test the system in an unburnished condition. If recommendations are furnished, record method used.

APPLY #	LEFT FRONT	RIGHT REAR	AVG REAR	DRIVER VEHICLE STOP COMMENTS (Direction of Stop (Up/Down) - Brake holds/fails)		
	1BT (°F)	1RT (°F)	1RT (°F)			
1	145	178	186.5	UPHILL	20%	HOLDS
2	173	161	169.0	DOWNHILL	20%	HOLDS

Is brake system indicator lamp activated: YES (X) NO ()

DATA INDICATES COMPLIANCE: YES (X) NO ()

Driver: RICHARD HERBEE

Observer: NONE

Recorded Data Processed by: CHUCK JENKINS

Date: 03/16/07

Approving Laboratory Official: JEFF SANKEY

Date: 03/20/07

APPENDIX C

CONTRACTOR'S TEST COMMENTS

For Data Sheet 20 – Parking Brake Test at GVWR, for the Uphill test, the data acquisition system did not log correctly and the recorded data was lost. However, the vehicle did hold uphill on the 20% slope for the required five minutes.

Though the vehicle was ABS equipped, during some of the tests at LLVW, the rear axle was locking – primarily the right rear wheel position. The lockup would not occur initially, rather during the mid-portion of the effect stop. On occasion, the ABS warning lamp alighted during these lockup stops, but other times it did not. When the lamp was on, the driver would turn off the engine and restart – this would then clear the lamp.

For Data Sheets 12 and 13, the 20 mph indicant stops were performed on March 5, 2007, after the six, 60 mph stops had been completed.

For Data Sheet 17, “Apply Time” is the time from the first movement of the service brake control until the service brake control line pressure reaches 85 psi. (Note: Accelerometer affixed to the service brake control to detect first movement.)

Per OVSC and as an indicant test, a 20 mph stop was performed at the end of each stop sequence.

6276661

Report No. 119-STL-04-007

**SAFETY COMPLIANCE TESTING
FOR
FMVSS No.119**

"New pneumatic tire for Vehicles other than Passenger Car"

***DUNLOP
RV RADIAL ROVER***

**Tests Conducted By:
*Standards Testing Labs***

1854 Harsh Ave., S.E.
Massillon, Ohio 44646



FINAL REPORT

May 25, 2004

PREPARED FOR

**U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, S.W.
ROOM 6111 (NVS-222)
WASHINGTON, D.C. 20590**

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement; The United States Government does not endorse products or manufacturers.

Report No.: 119-STL-04-007

Test No.: B4S5007B

Prepared by: Tim Phillips

Approved by: Chuck Phillips

Date: May 25, 2004

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: *GP Gillispie*

Acceptance Date: *June 8, 2004*

Technical Report Title Page

1. Report No. 119-STL-04-007	2. Govt. Accession No.	3. Recipient's Catalog No.:	
4. Title and Sub-Title: FINAL REPORT OF FMVSS NO. 119 MANUFACTURER: DUNLOP TIRE NAME: RV RADIAL ROVER BRAND: DUNLOP		5. Report Date: May 25, 2004	
		6. Performing Organization Code: STL	
7. Author: Chuck Phillips - Lab Manager		8. Performing Organization Report No.: B4S5007B	
9. Performing Organization Name and Address: Standards Testing Labs 1845 Harsh Ave., S.E. Massillon, Ohio 44646		10. Work Unit No.:	
		11. Contract or Grant No.: DTNH-00-C-01105	
12. Sponsoring Agency Name and Address: U.S. Department of Transportation National Highway Traffic Safety Administration 400 Seventh Street, S.W. Room 6111 (NVS-222) Washington, D.C. 20590		13. Type of Report and and Period Covered: October 2003 - September 2004	
		14. Sponsoring Agency Code: NVS-222	
16. Abstract: Compliance tests were conducted on the subject tires in accordance with the Office of Vehicle Safety Compliance Test Procedure No. TP-119-04 to determine if the tires meet the requirements of FMVSS No. 119. Test failures identified were: NONE			
17. Key Words: FMVSS No. 119 Compliance Testing Safety Engineering		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Room 2330 (NPO-230) 400 Seventh Street, S.W. Washington, D.C. 20590 Telephone No. 1-800-445-0197	
19. Security Classification (Of This Report Unclassified)	20. Security Classification (Of This Report Unclassified)	21. No. of Pages:	22. Price

TEST LAB: STL

FMVSS 119 CATEGORY B TEST - TIRE TEST REPORT

TIRE NUMBER: B4S5007B

MANUFACTURER:	DUNLOP	SIZE:	LT235/75R15
MAN. CODE:	DA	LOAD RANGE:	C
BRAND:	DUNLOP	MATERIAL CARC:	2P
ID NO:	DAHK636V3202	MATERIAL BELT:	2S
MAX INFL. SINGLE PSI/KPA:	50 350	MATERIAL BELT:	2P
MAX INFL. DUAL PSI/KPA:	50 350	CONSTRUCTION:	R
MAX LOAD SINGLE LBS/KG:	1985 900	SPEED RATING:	N/A
MAX LOAD DUAL LBS/KG:	1820 825	SPEED RESTRICTION:	0
		REPLACEMENT:	

TIRE ENDURANCE TEST

PRETEST OK (Y/N) Y

RIM CONDITION OK (Y/N) Y

TEST RIM: 6.5 RIM USED: 6.5 RIM NO: 468 TEST PSI: 50

	DATE	TIME	PSI	TEMP	
3 HOURS CONDITIONING	START: 3/15/2004	1600	50	101.1	COND. 3 HRS? (Y/N)
(95 DEG F +0 OR -10)	END: 3/17/2004	1800	50	101.1	Y

INFLATION PRESSURE ADJUSTED FROM 50 PSI TO 50 PSI

WHEEL POS A MACHINE NO 112 MACHINE TYPE: HYDRAULIC

ENDURANCE TEST START DATE: 3/17/2004 END DATE: 3/19/2004

TIME	1810	0110	1710	1710
REQ. LOAD	0	1489	1925	2263
ACT. LOAD	0	1489	1925	2263
REQ. SPEED	50	50	50	50
ACT. SPEED	0	50	50	50
AMBIENT TEMP	101.1	101.1	98.5	97.2
PSI	105			61
STEP HOURS	0	7	16	24
TOTAL HOURS	0	7	23	47

RESULTS (PASS/FAIL)

PASS

REMARKS NONE

TESTED BY: EG 3/19/2004

SIGNATURE

DATE

LAB APPROVAL:

SIGNATURE AND TITLE

DATE

TEST LAB: STL FMVSS 119 TIRE TEST REPORT - SUMMARY, LABELING TEST TIRE NUMBER: B4S5007

MTL - 007		SIZE: LT235/75R15
MANUFACTURER: DUNLOP		LOAD RANGE: C
TIRE NAME: RV RADIAL ROVER		MATERIAL CARC: 2P
BRAND: DUNLOP		MATERIAL BELT: 2S
ID NO: DAHK636V3202		MATERIAL BELT: 2P
MAX INFL. SINGLE PSI/KPA: 50 350		CONSTRUCTION: R
MAX INFL. DUAL PSI/KPA: 50 350		SPEED RATING: N/A
MAX LOAD SINGLE LBS/KG: 1985 900		SPEED RESTRICTION:
MAX LOAD DUAL LBS/KG: 1820 825		REPLACEMENT:

TEST CATEGORY A, B, C	TIRES	TEST RESULT P/F	REMARKS
LABELING	A, B, C	N/A,PASS,N/A	
PHYSICAL DIMENSION	A		
BEAD UNSEATING	A		
STRENGTH	A		
ENDURANCE	B	PASS	
HIGH SPEED	C		

LABELING REQUIREMENTS	TIRE A	TIRE B	TIRE C
BRAND NAME	DUNLOP		
SIZE DESIGNATION	LT235/75R15		
MAX INFL. PRESS. (psi)	50		
MAX LOAD RATING (lbs)	1985		
	PLY	MAT	PLY MAT
CARCASS MATERIAL	/	2P	
BELT MATERIAL	/	2S	
BELT MATERIAL	/	2P	
TUBELESS/TYPE		TL	
CONSTRUCTION		R	
ID. NUMBER	DA-3202		
CONF. SYMBOL (Y/N)		Y	Y
TRD. WEAR IND. (Y/N)		Y	Y

LAB APPROVAL:
Charles M Phillips Lt Manager
 Signature & Title

Date: 5/25/04

NHTSA ACCEPTANCE:

Signature
 Date: / /

R-RAYON	N-NYLON	P-POLYESTER	S-STEEL	F-FIBERGLASS	G-NYGEN
A-ARAMID	D-DUPONT/DPI	T-TUBE TYPE	L-TUBELESS	S&E-BELTED BIAS	
A&R-RADIAL	B&I-BIAS PLY	W-ALL WEATHER			